The Iron Age
A Chilton Publication
THE NATIONAL METALWORKING WEEKLY • OCTOBER 6, 1955
Special Metal Show Issue

Aircraft Torque Wrench

Split Bearing Race

Pump Part

Slitter Knife

Machine Tool Part

Collet

How to cut machining time on hard, tough parts like these

A STEEL can be hard and tough without needing to be hard and tough *to machine*. If you need such a steel for slitter knives, machine tool parts, pump parts, or other parts where wear resistance and strength are important, get Timken 52100 steel.

Its fully spheroidizing structure makes 52100 easy to machine. And without sacrificing strength or hardenability!

This high-carbon analysis alloy steel has high fatigue and tensile strength as well as good hardenability throughout its cross section. Timken 52100 steel will withstand working pressures up to 200,000 p.s.i., and can be oil quenched to a maximum hardness of 65/66 Rockwell C. in normal sections.

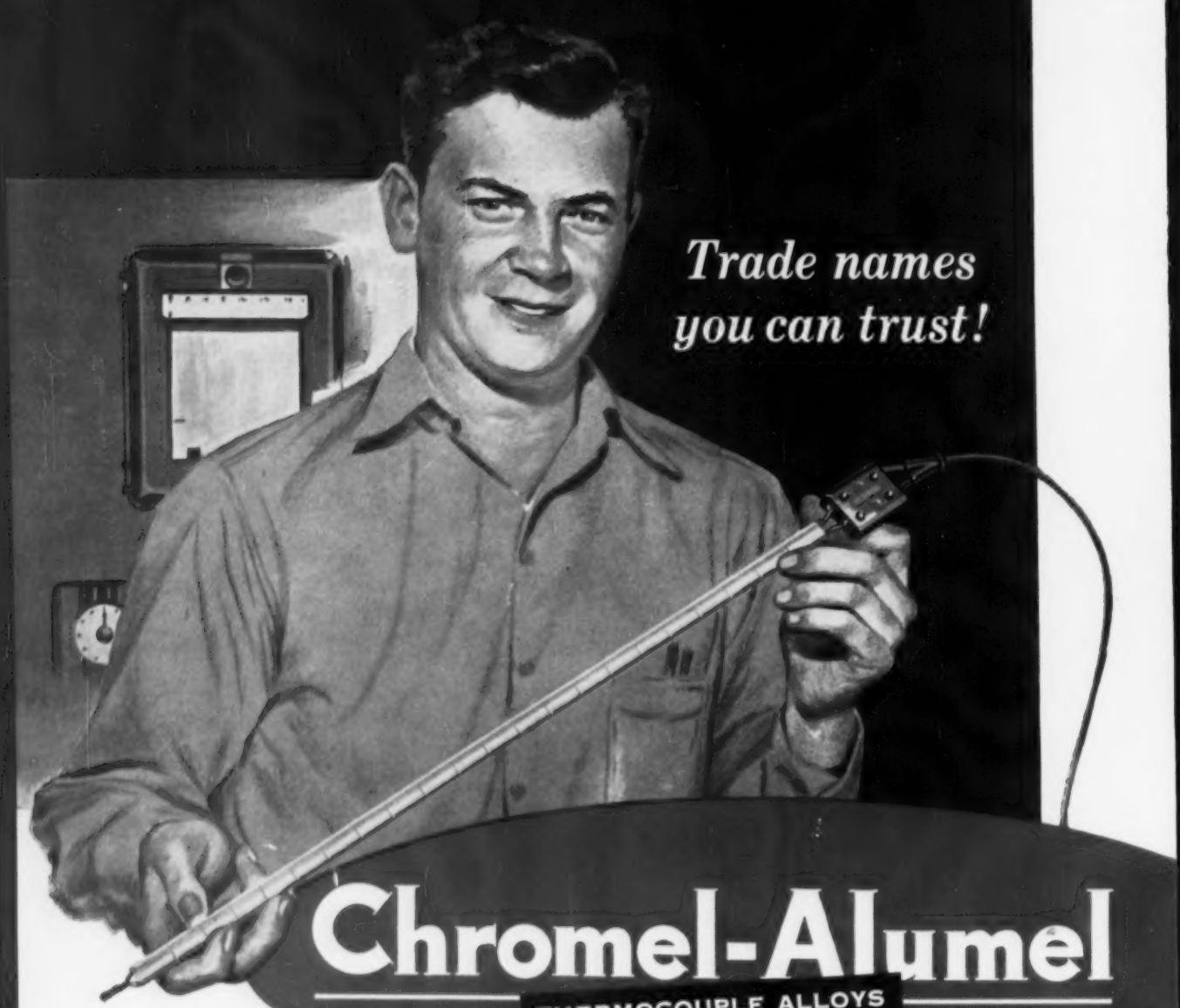
Rigid quality control at every step in production is your assurance of uniform quality in every shipment. The Timken Company pioneered the production of 52100. We are one of the world's largest producers of 52100 and the *only* source of 52100 steel in three finished forms—bars, tubes and wires. And for small run or emergency requirements, the Timken Company maintains a mill stock of 101 sizes of 52100 tubing, ranging from 1" to 10½" O.D.

For a stock list of available sizes, grades and finishes, write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable: "TIMROSCO".

TIMKEN Fine Alloy STEEL

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◊ AND THRUST —▯— LOADS OR ANY COMBINATION —✳—

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭



Trade names you can trust!

Chromel-Alumel

THERMOCOUPLE ALLOYS

FOR ACCURACY!

Chromel-Alumel thermocouple alloys are unconditionally guaranteed to register true temperature—e.m.f. values within close specified limits . . . ±4°F. from 0° to 530°F.; ±¾% at operating temperatures from 531° to 2300°F.

FOR DURABILITY!

They're highly resistant to oxidation, extremely sensitive to temperature variations. And they maintain their fine accuracy over a wider range of temperatures for far longer periods of time than any other base metal material.

FOR ECONOMY!

Despite their finer accuracy, higher temperature range, and longer useful life, Chromel-Alumel thermocouple wire costs the user no more than ordinary base metal materials . . . and in many cases, they actually cost less!

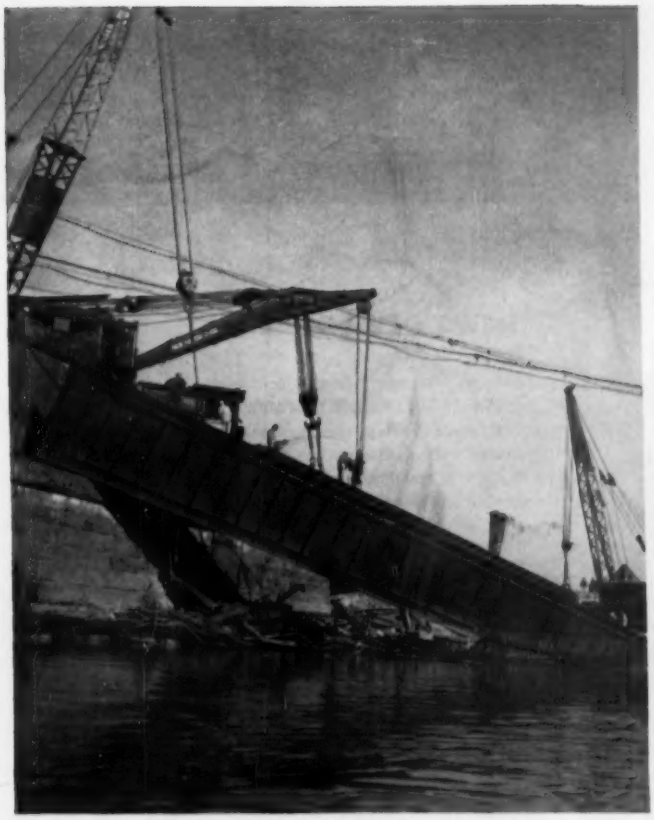
Ask for them by name! Your instrument manufacturer or pyrometer service company can supply your immediate requirements for plain or insulated wire and assembled couples. So ask for them by name . . . "Chromel-Alumel" thermocouples . . . trade names you can trust!

Chromel-Alumel thermocouple alloys are produced exclusively by

HOSKINS MANUFACTURING COMPANY

4445 LAWTON AVENUE • DETROIT 8, MICHIGAN

BEARING TAKES RADIAL AND THRUST — LOADS OR ANY COMBINATION



SALVAGING GIRDERS FROM RIVER BED—At the wrecked Naugatuck River Bridge of the New York, New Haven and Hartford Railroad at Waterbury, Conn., girders are being salvaged from the river bed. We rushed approximately 500 ft of wire rope to Waterbury for this operation.

NEW BRIDGE ON PENNSYLVANIA'S ROUTE 11—This emergency bridge will carry Route 11 over Spring Brook Creek, south of Scranton. The new bridge is being built with Bethlehem H-piling and structural steel.

Steel Rushed to Flooded Areas Aids Reconstruction Task

Even before the flood waters that followed Hurricane Diane had started to recede, we began to receive urgent calls for steel. Soon it was clear that immense quantities of steel would be quickly needed to relieve human distress and restore normal life and activities.

NEW BOX CULVERT FOR BOSTON AND ALBANY R. R.—When dams gave way near Springfield, Mass., the torrent washed out high railroad embankment. Note tracks (arrow). Bethlehem rushed 280 tons of steel reinforcing bars for new culvert, shown in foreground.

We saw that we could meet the acute need only by breaking into production schedules and utilizing the full facilities of Bethlehem plants and mill stocks. We were sure that any of our customers whose orders might be affected would approve our course.

So within a few hours the initial emergency shipments were on their way. Thousands of tons of structural shapes, piling, reinforcing bars and rails were rolled and rushed to the stricken areas. In some cases steel was rolled and shipped within hours after receipt of the order.

All major Bethlehem plants in the East have shared in meeting the flood emergency. Our plant at Bethlehem, Pa., largest producer of structural shapes in this country, was itself a flood casualty, but as the plant got back into operation its output also was made available to help in repairing flood damage.

But the task was one in which many companies shared. In this emergency, as in many another, in peacetime and in war, the steel industry has always been prepared to pitch in and deliver the materials needed to serve the national interest.

BETHLEHEM STEEL

BETHLEHEM STEEL

The Iron Age

Vol. 174, No. 14, October 6, 1955

DIGEST OF THE WEEK

Starred items are digested at the right

EDITORIAL

What Are You Afraid Of? ... 7

NEWS OF INDUSTRY

*Special Report: Metals Boom on Delaware ... 147
*Research: Industry Stages Atomic Display ... 151
*International: Reds Seek Technicians ... 152
*Marketing: Aerosol Bombs Branch Out ... 153
*Production: Automakers Fight Shortages ... 154
Industrial Briefs ... 162
Personnel: Iron Age Salutes ... 177
Iron Age Introduces ... 179
Clearing House ... 304

NEWS ANALYSIS

Newsfront ... 145
Report to Management ... 161
*Automotive Assembly Line ... 164
*This Week in Washington ... 169
West Coast Report ... 173
*Machine Tool High Spots ... 175

TECHNICAL ARTICLES

*How to Get More for Your Steel Dollar ... 189

A special editorial feature giving practical tips for the efficient buying and use of steel.

National Metal Show Program ... 208
National Metal Show Exhibitors ... 258
Materials Briefs ... 206
Technical Briefs ... 212

MARKETS & PRICES

*The Iron Age Summary—Steel Outlook ... 287
Steel Product Markets ... 288
Comparison of Prices ... 289
*Nonferrous Markets ... 294
*Iron and Steel Scrap Markets ... 290
Steel Prices ... 297

REGULAR DEPARTMENTS

Dear Editor ... 9
Fatigue Cracks ... 11
Dates to Remember ... 13
Free Literature ... 234
New Equipment ... 275

INDEX OF ADVERTISERS ... 314

Copyright 1955, by Chilton Co. (Inc.)

THE IRON AGE, published every Thursday, with an additional issue in June, by CHILTON CO. (INC.), Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1932, at the Post Office at Philadelphia under the act of March 3, 1879. Price to the metalworking industries only, or to people actively engaged therein, $5 for 1 year, $8 for 2 years in the United States, its territories and Canada. All others $15 for 1 year; other Western Hemisphere countries, $15; other Foreign Countries, $25 per year. Single copies, 50¢. Annual Review Issue, $2.00. Cables: "Ironage," N. Y.

Address mail to Chestnut and 56th Sts., Philadelphia 39, Pa.

NEWS DEVELOPMENTS

METALWORKING BOOMS ALONG THE DELAWARE—P. 147
Delaware Valley area is enjoying a general industrial boom with metalworking firms in the lead. The area, with transportation, supply and market advantages, has seen capital expenditures of more than $1.5 billion on new and improved metalworking facilities in the past 10 years. Metalworking employment is up 23 pct; wage earnings have gone up 25 pct in the past 3 years. No one factor has brought the boom. The area has advanced on all fronts with business gains by individual companies bringing chain-reaction progress.

INDUSTRY STAGES ATOMIC ENERGY DISPLAY — P. 151
First U. S. Trade Fair of Atomic Industry saw 75 exhibitors showing reactors, instruments and controls in Washington, D. C. Affair was marked by a merchandising approach new to the atomic field. A full array of scientific leaders turned out but physicists and engineers showed an appreciation of the selling effort that must accompany nuclear development. Some 13 companies were on hand to stimulate sales. Many of the exhibits came directly from the "Atoms for Peace" conference.

REDS TURN TO TECHNICIANS FOR HELP — P. 152
Bulganin hits at Red industry in attempt to revitalize economy. Kremlin seeks technical help as well as West trade to solve economic ills. Engineers and technicians are replacing bureaucrats in next 5-year plan. Meanwhile, some improvements in steel production and other segments of industry have been made.

AUTOMAKERS FIGHT MATERIALS SHORTAGES — P. 154
Steel, copper and nickel are in shortest supply. Warehouses are tapped to keep production going. Gray market nickel is used by small platers. Auto companies fight to keep plating specifications up. Substitutions for copper are on the increase with aluminum getting most frequent call. Auto companies with financial interest in steel have advantage but no guarantee.

REPUBLICANS PIN HOPES ON PEACE, BOOM — P. 169
With President Eisenhower's illness making his retirement from public life likely, Republican planners are hoping that national well-being may carry another candidate to the White House. Any sign of economic weakness will bring fast bolstering action from the Administration. But there's no question that loss of Mr. Eisenhower will hurt.

IN METALWORKING

MARKETS & PRICES

AEROSOL BOMBS SPLATTER BIG MARKET — P. 153
Pressure packaging has definitely caught on with Americans. Popularized as "bug bombs" in World War II, the pressurized containers are now taking paint, whipped cream, shampoos and many others. The industry is expected to turn out about 300 million units this year against some 96 million in 1952. Future looks bright, will call for added stocks of blackplate, tinplate and aluminum.

CONTINENTAL LOOKS FOR $10,000 MARKET — P. 164
Ford's super luxury car will determine if public will pay that much for prestige factor. Horsepower will not be publicly disclosed. Only a limited number of Continentals will be produced. Studebaker-Packard hopes 1956 will be turning point. New Studebaker drops foreign look, will revert to conventional styling.

ARMY LINES UP STAND-BY MACHINE TOOLS — P. 175
Korea finally taught the importance of production preparedness. The Army is readying an equipment program that will get defense industry off to a running start in the event of enemy attack. Complete production lines are being stored, either in plants or in separate storage areas. Some machines are warmed up periodically. Others just sit and wait.

MARKETS & PRICES

STEEL MARKET OUTLOOK; CONTINUED STRONG—P. 287
Steel producers and consumers are face-to-face with a continued strong market for virtually all products. Prospects of any relief appear to be extremely remote. One of biggest post-war freight car programs is shaping up and other industries are scheduling equally busy production programs. Steel inventories are precarious in warehouses and a buildup will be a long time coming.

SCRAP EXPORT RULES WILL STAY THE SAME — P. 290
Commerce Dept. rules existing regulations covering iron and steel scrap exports will stay in effect until further notice. Action is a victory for foreign policy planners of Administration over Commerce officials, and dashes hopes of steel mills that a tight scrap supply would be eased by export curbs. Domestic scrap market is strong and tight, figures to stay that way as long as steel operating rates remain high.

ODM SPEAKS ON COPPER, ALUMINUM, NICKEL—P. 294
ODM chief Arthur Flemming this week turned down a plea for the release of copper from the national stockpile. He told the "big three" in aluminum they would soon know how much they would have to supply to U. S. in 1956 first quarter and he diverted more nickel to industry.

SPECIAL METAL SHOW ISSUE—

HOW TO GET MORE FOR YOUR STEEL DOLLAR

This helpful special feature gives practical, down-to-earth answers to the problems involved in buying and using steel for both large and small plants.

Efficient steel buying and processing depends on two basic rules. 1. Keeping steel extras to a minimum. 2. Selecting steels best suited to the processing and end use of your product. With these in mind, this special feature is divided into two sections, Purchasing and Processing. At right are some of the subjects covered in each part.

PURCHASING —P. 189
Drawing Quality . . . Surface Finish Extras . . . Cold Rolled v. Hot Rolled . . . Chemistry Extras . . . Plain Carbon v. Alloy . . . Working Tolerances.

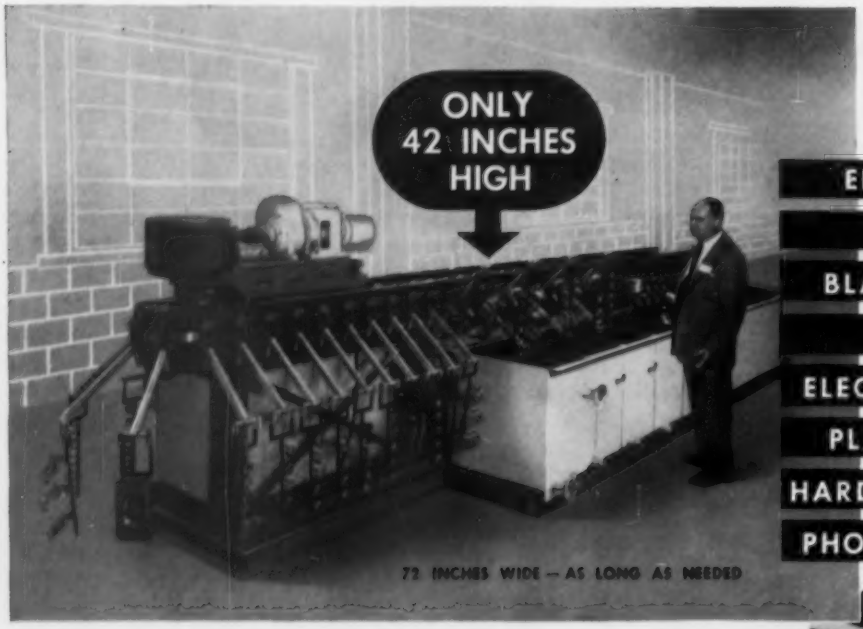
PROCESSING —P. 198
Materials Inspection . . . Quality Control . . . Furnace Controls and Equipment . . . Plating Problems . . . Controlled Carburizing . . . Nitriding . . . Normalizing.

METAL SHOW PROGRAM —P. 208
Programs of the societies participating in the Metal Congress give time, date and place of technical paper presentations.

LISTS OF METAL SHOW EXHIBITORS — PP. 258, 268
The classified list of metal show exhibitors on p. 258 will give you a fast summary of the different products displayed, will aid in planning your show coverage.

MEET "LITTLE STEVE," A NEW, SPACE SAVING, LOW COST AUTOMATIC PLATING AND IMMERSION PROCESSING MACHINE

Here's What "Little Steve" Can Do



- ELECTROPLATING
- ANODIZING
- BLACK JAPANNING
- ENAMELING
- ELECTROTYPE PLATING
- PLASTIC COATINGS
- HARD CHROME PLATING
- PHOSPHATE COATINGS

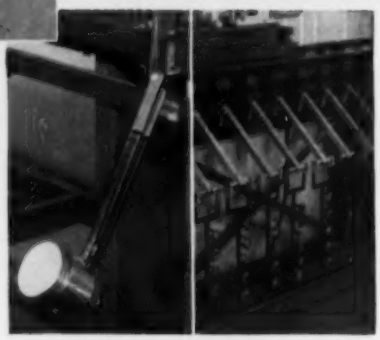
UP TO 40,000 PIECES PER DAY
540 RACKS PER HOUR

Yes, this new immersion processing machine by Stevens can process up to 40,000 pieces per day – and it has a variety of other uses too.

Ruggedly built "LITTLE STEVE," the hit of the 4th Industrial Finishing Exposition, can be obtained at a surprisingly low initial cost. It is ideal for large or small companies for it will fit many production cycles. It uses an arm as a rack or will take racks for small parts.

Being of small size it offers no floor space or load problems; involves low solution expense and means a small capital investment. It can be used easily as a laboratory testing machine.

For further information about "LITTLE STEVE" write for illustrated folder or call your local Stevens sales engineer.



A single part can be placed on each carrier arm as shown in the illustration above or racks of numerous parts can be used.

If a larger production model is desired the "Sgt. Steve" unit, using the same basic design, will provide the answer.

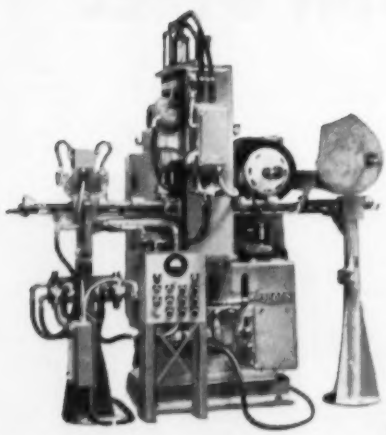
BRANCHES: BUFFALO • CLEVELAND • INDIANAPOLIS • NEW HAVEN

FOUNDRY FACINGS | GRINDING OPERATIONS | BLAST FINISHING | BARREL TUMBLING | METAL CLEANING | POLISHING & BUFFING | AUTOMATIC FINISHING | AUTOMATIC PLATING | METAL RECLAMATION

Metal Finishing equipment and supplies from castings or stampings to finished product.

FREDERIC B.
STEVENS
INCORPORATED
YOUR METAL FINISHING SUPERMARKET
DETROIT 38, MICHIGAN

BRUSHAMATION BY OSBORN



AUTOMATED BRUSHAMATIC®...One of Osborn's integrated production line automatic power brushing machines.

The parts shown above are typical of the work you can now handle with Osborn's line-production power brushing method... ***BRUSHAMATION.***

COMPLETELY INTEGRATED...Osborn's Automated Brushamatic® Equipment fits right into your production line.

ELIMINATES BOTTLENECKS. It is now possible to remove burrs, blend surface junctures, remove weld scale, clean parts on a continuous line-production basis.

AUTOMATES FINISHING OPERATIONS... takes parts right from your production lines, feeds them to rotating power brushes, delivers them precision-finished to micro-tolerances where necessary

... all without manual handling.

Qualified engineers will show how you can benefit with automated brushing at the Osborn Booth 718, The Metal Show, Philadelphia, Oct. 17-21. If you can't make the show, write us for complete information. *The Osborn Manufacturing Company, Dept. F-37, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

Osborn Brushes

© 1955 The Osborn Manufacturing Company

OSBORN

BRUSHING METHODS • POWER, PAINT AND MAINTENANCE BRUSHES
BRUSHING MACHINES • FOUNDRY MOLDING MACHINES

Do you really know the alloys you buy?

For instance, are you SURE of:

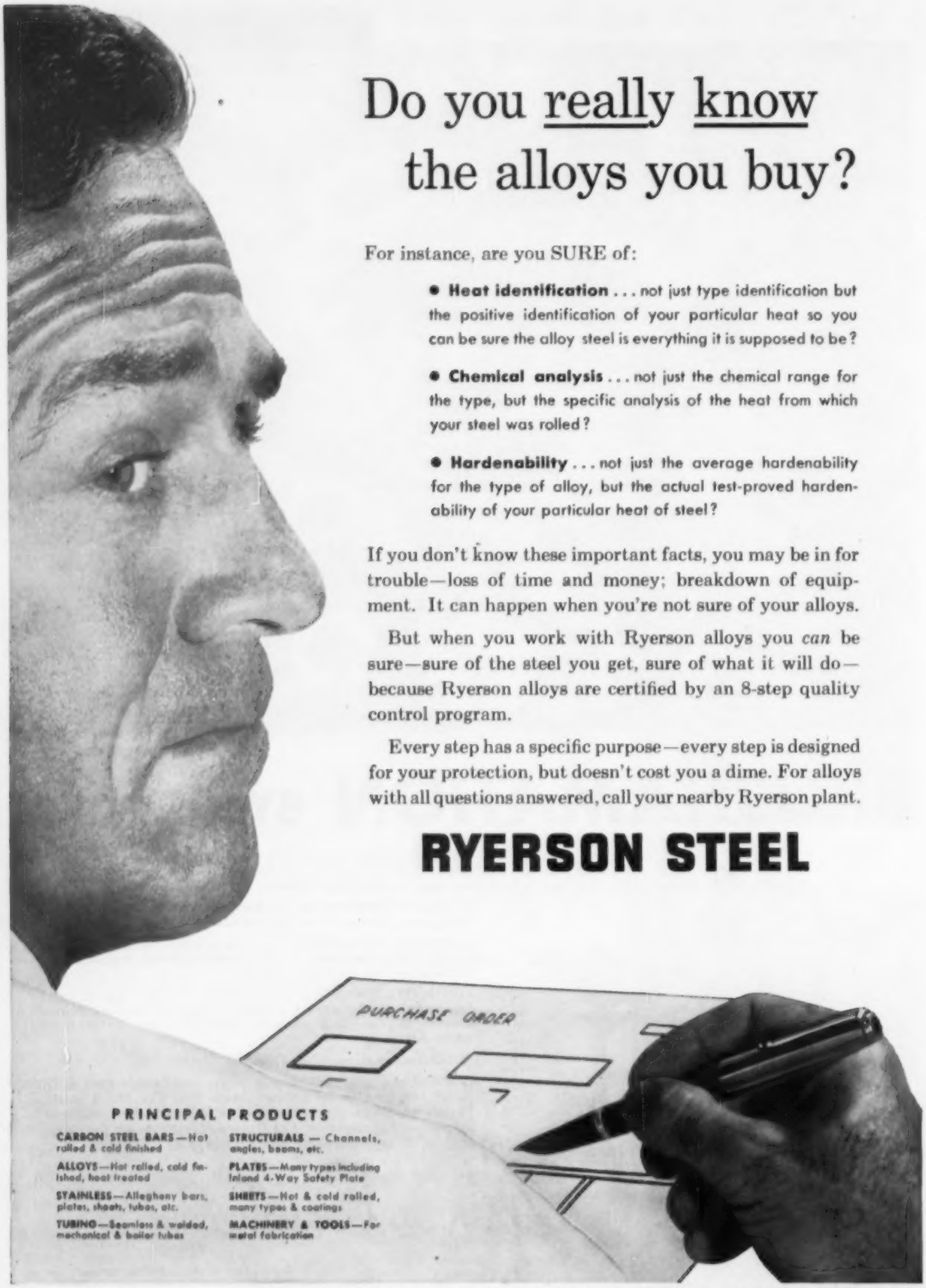
- **Heat identification** . . . not just type identification but the positive identification of your particular heat so you can be sure the alloy steel is everything it is supposed to be?
- **Chemical analysis** . . . not just the chemical range for the type, but the specific analysis of the heat from which your steel was rolled?
- **Hardenability** . . . not just the average hardenability for the type of alloy, but the actual test-proved hardenability of your particular heat of steel?

If you don't know these important facts, you may be in for trouble—loss of time and money; breakdown of equipment. It can happen when you're not sure of your alloys.

But when you work with Ryerson alloys you *can* be sure—sure of the steel you get, sure of what it will do—because Ryerson alloys are certified by an 8-step quality control program.

Every step has a specific purpose—every step is designed for your protection, but doesn't cost you a dime. For alloys with all questions answered, call your nearby Ryerson plant.

RYERSON STEEL



PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled & cold finished

ALLOYS—Hot rolled, cold finished, heat treated

STAINLESS—Alleghany bars, plates, sheets, tubes, etc.

TUBING—Seamless & welded, mechanical & boiler tubes

STRUCTURALS — Channels, angles, beams, etc.

PLATES—Many types including Inland 4-Way Safety Plate

SHEETS—Hot & cold rolled, many types & coatings

MACHINERY & TOOLS—For metal fabrication

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI • CLEVELAND DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Iron Age

Chestnut and 56th Sts.
Philadelphia 39, Pa.
SHerwood 8-2000

GEORGE T. HOOK, Publisher

EDITORIAL STAFF
TOM C. CAMPBELL, Editor-in-Chief
GEORGE F. SULLIVAN, Editor

Managing Editor E. C. Beaudet
News-Markets Editor J. B. Delaney
Technical Editor J. J. Obrzut
Engineering Editor W. G. Patton
Machinery Editor E. J. Egan, Jr.
Metallurgical Editor P. Unterweiser
Asst. News-Mkts. Ed. R. D. Raddant
Art Director J. A. Degen
Associate Editors: H. W. Van Camp, G. J. McManus, J. G. Long. Assistant Editor: F. J. Starin. Regional Editors: D. G. Picinich, Chicago; T. M. Rohan, Cleveland; T. L. Carry, Detroit; W. G. Brookfield, Pittsburgh; R. R. Kay, Los Angeles; G. H. Baker, R. M. Stroupe, N. R. Regelmbal, Washington Editorial Assistants: M. A. Perrone, M. T. Powers, A. Schaeffer. Correspondents: F. L. Allen, Birmingham; N. Levenson, Boston; R. M. Edmonds, St. Louis; J. Miller, San Francisco; R. Kazarian, Buffalo; F. Sanderson, Toronto; F. H. Harley, London, England; Chilton Editorial Board: Paul Wooton, Washington representative.

WASHINGTON EDITORIAL OFFICE
Washington 4..... National Press Bldg.

BUSINESS STAFF

Production Manager B. H. Hayes
Director of Research Oliver Johnson
Circulation Mgr. W. M. Coffey
Promotion Manager J. A. Crites
Asst. Research Dir. Wm. Laimbeer

REGIONAL BUSINESS MANAGERS

Chicago 2.....S. J. Smith, T. H. Barry
1 N. LaSalle St. Franklin 2-0202
Cleveland 14.....Robert W. Watts
1016 Nat'l City Bk. Bldg. Main 1-2263
Columbus 15, Ohio.... Harry G. Mumm
LeVeque-Lincoln Tower Capitol 1-3764
Detroit 2..... Peirce Lewis
103 Pallister Ave. Trinity 1-3120
Los Angeles 28.....R. Raymond Kay
2420 Cheremoya Ave. Holy'd 7-0741
New York 17...C. H. Ober, C. T. Post
100 E. 42nd St. Oxford 7-3400
Philadelphia 39.....B. L. Herman
56th & Chestnut Sts. SHerwood 8-2000
Pittsburgh 22.....J. M. Spackman
1502 Park Bldg. Atlantic 1-1832
W. Hartford 7.....Paul Bachman
62 Lasalle Rd. Adams 2-0486
England..... Harry Becker
National Provincial Bank Chambers, 15 Gratton St., Altrincham, Cheshire.

One of the Publications Owned and Published by Chilton Co. (Inc.), Chestnut & 56th Sts., Philadelphia 39, Pa.

OFFICERS AND DIRECTORS
Joseph S. Hildreth, Ch. of the Board
G. C. Busby, President

Vice-Presidents: P. M. Fahrendorf, Harry V. Duffy; Treasurer, William H. Vallar; Secretary, John Blair Moffett; Directors: George T. Hook, Maurice E. Cox, Frank P. Tighe, L. V. Rowlands, Robert E. McKenna, Irving E. Hand, Everit B. Terhune, Jr., R. W. Case, Jr., John C. Hildreth, Jr.

Indexed in the Industrial Arts Index and the Engineering Index.

BPA NBP

Editorial:

What Are You Afraid Of?

◆ THE EISENHOWER SPIRIT is one of faith in the American people and their government. No one person is more important than his country. President Eisenhower believes that; he has indicated so only recently.

There has been speculation that some businessmen may lose faith in the nation's economy because of possible consequences of the President's illness. If that were to happen—and we doubt that many think like that—it would be an excellent way to retard the growth of the country and the recovery of the President.

Upon the strength of the United States rests the hope of millions of people in Europe and in Asia. Upon the integrity of our country depends the free world's ability to withstand the machinations of the Communist world. Upon the faith of the American people depend the growth and future of our children.

Upon businessmen rests the solemn moral responsibility to do nothing that would contribute to a weakening of our country. No longer can the actions of important people in one part of the country be divorced from their effect upon those in other parts of the country —or the world.

We are all dependent upon each other. We have our differences but in a crisis we are always together. If anything should happen to the economy of this country because of poor business judgment or fringe hysteria, all would suffer.

As a nation we are too grown up to believe that even the changing of parties in power will make or break our country. If we honestly believed that we would indeed be doomed. Of course we debate, frown upon and condemn the "other" party. But none of us would dare do this to the extent of being partly responsible for a national hysteria that could bring chaos to our country's welfare.

This is the time to realize that our President needs our help. To help him and our Government we must follow his type of unselfish and patriotic thinking. If anyone should tell us that is naive thinking, then let us be naive.

Let us feel that we and our children have nothing to fear in a country which produces men like President Eisenhower. Not to be afraid for our country's future—that is being realistic.

Tom Campbell

EDITOR-IN-CHIEF

Puzzled About Design?

TO CHANGE THE Style

CHANGE THE STEEL

SWITCH TO *Sharonart*

If your product is made of metal that must have eye appeal, you should know about *Sharonart*—Sharon's amazing new surface rolled patterns in steel. May be painted or plated.

Many of the nation's leading product designers are already including these handsome patterns in their products of tomorrow. It isn't necessary to alter the design of your product to achieve a new look—simply change the style by changing the steel.

If you have a design problem, why not look into Sharonart? A descriptive booklet is ready for you. Simply call the Sharon office nearest you or write direct.

SHARONSTEEL

SHARON STEEL CORPORATION

Sharon, Pennsylvania

DISTRICT SALES OFFICES: Chicago, Cincinnati, Cleveland, Dayton, Detroit, Grand Rapids, Indianapolis, Los Angeles, Milwaukee, New York, Philadelphia, Rochester, San Francisco, Sharon, Montreal, Que., Toronto, Ont.

SHARON STEEL CORPORATION IA-10655
Sharon, Pennsylvania

Please send Sharonart Surface Rolled Patterns in Steel brochure ☐
Galvanite booklet ☐ Sharon 430 Stainless Steel Folder ☐

Name_____

Position_____

Company_____

City_____ Zone____ State_____

dear editor: *letters from readers*

Steel Scrap Specs

Sir:

I would appreciate your advising me how I might obtain a copy of the specifications which apply to various grades of steel scrap. *J. N. Day, Supervisor Materials Handling, Titanium Metals Corporation of America, P.O. Box 2128, Henderson, Nev.*

Steel scrap specifications are listed in the "Institute of Scrap Iron & Steel Yearbook." A copy may be obtained from the Institute, 1729 H Street, N.W., Washington 6.—Ed.

Rare Earths

Sir:

We have quite an ample supply on hand of your reprints "Rare Earths Improve Impact Properties of 4330," after filling our own needs. If you have any requests for this article, we will be pleased to fill them. *J. H. Clark, Sales Manager, Metallurgical Enterprises, Buffalo 7.*

Readers who want reprints of this article, which appeared in our May 26, 1955 issue, may obtain them by writing directly to Mr. Clark.—Ed.

Excerpts

Sir:

May we have your permission to reprint short quotations and condensations from your magazine?

We plan to distribute to our 350 members each month, and to a limited number of other engineers in the General Electric Co., a one page collection of excerpts from leading publications. These excerpts would deal mainly with the professional, economic, and ethical phases of engineering.

This news letter we plan to distribute would not be for profit. Its purpose is to inform and to encourage wider discussion of issues affecting engineers. *B. P. Miracle, Publications Committee, Fort Wayne Assn. of General Electric Engineers, 181 Travers Place, Fort Wayne, Ind.*

New Powdered Material

Sir:

An article which appeared in your August 11, 1955, issue entitled "New Powdered Material Reduces Bearing Wear" is of interest to our personnel engaged in the critical materials conservation program of the U. S. Army Corps of Engineers.

Our conservation program would be aided considerably if we could receive 150 reprints or your permission to reproduce this article for distribution to laboratories and procurement offices within the Corps of Engineers. *B. W. Oman, Ass't, Procurement Div. Military Supply, Dept. of the Army, Office of the Chief of Engineers, Washington.*

"100 Years"

We found this to be the most interesting IRON AGE issue that we have received in our long subscription to it. *Luria Bros. & Co., Inc., Philadelphia National Bank Bldg., Phila.*

There is no doubt in my mind but that this will be a constant reference. *G. A. Sabin, Director of Advertising, The Colorado Fuel and Iron Corp., Denver.*

Your "100 Years of Metalworking" issue is certainly an outstanding piece of work and a splendid monument to industrial publishing. *J. N. McCracken, Mgr., Gas Processes Div., General Publicity Dept., Linde Air Products Co., 30 E. 42nd St., New York.*

Really, this is an outstanding job and we are placing this copy in our A.G.A. Library after our Staff have had a chance to see it. *N. D. Jennings, Adv. Mgr., American Gas Assn., 420 Lexington Ave., New York.*

DON'T GIVE ME THAT!

YOU CAN'T BEAT GARRETT SERVICE

I'm not a wise guy, but I do know about the service these Garrett plants give you. Seems hard to believe. Those fellows bend over backwards to help you out in an emergency. And their regular service means you always get deliveries when promised ... sometimes before.

Of course, when it comes to quality they are tops on lock washers, flat washers, spring washers, hose clamps, stampings and assemblies. They have three plants equipped with the most modern high-speed automatic machinery to turn out billions of parts to exact specification . . . complete heat treating, plating and finishing facilities. If you don't believe me, next time send your order into Garrett. You'll see why their customers say YOU CAN'T BEAT GARRETT.

LOCK WASHERS
FLAT WASHERS
HOSE CLAMPS
STAMPINGS

Manufactured by

GEORGE K. GARRETT CO., Inc.
Philadelphia 34, Pa.

Garrett
OF PHILADELPHIA

BAKER announces a NEW LINE of BATTERY-POWERED FORK TRUCKS

with many added features...

Capacities to 6000 pounds

● **EASIER TO STEER**—Less weight on steering axle, combined with automotive type steer, provides finger-tip control even on largest models.

● **MORE CONVENIENT CONTROLS**—Located right where operator wants them. Easy and simple to actuate.

● **FULL VISIBILITY**—No cowl, no console—no "neck craning." Greater safety, less operator fatigue, more work.

● **EASIER TO GET ON OR OFF**—Absence of cowl and other obstructions means easier and faster mounting and dismounting.

● **DYNAMIC BRAKING**—Greater safety on ramps, smoother stops, less wear on brake lining, greater protection for truck and load.

● **SEPARATE PARKING BRAKE LINKED TO DRIVER'S SEAT.** Automatically holds truck when driver dismounts—even on incline. On armature shaft—independent of wheel brakes.

● **HYDRAULIC WHEEL BRAKES**—Finest available. Self-energizing, self-equalizing. Single point adjustment.

● **STRONGER STEERING AXLE**—Double-yoke construction and rubber mounting reduces road shocks and means smoother riding for operator and load.

The new Baker FT line of electric fork trucks is engineered for maximum efficiency, operating convenience and economy, with minimum maintenance and down time. Reliable Timken axle is specially designed for industrial truck use. Less overhang, lighter weight, greater stability, shorter turning radius, more forward tilt and lower silhouette are advantages gained in this new design.

Every Baker "FT" has a *full one year warranty*—proof of our confidence in our workmanship and quality. Elements that have built the outstanding reputation for previous Baker electric trucks have been retained, and new features added. Ideal placement of hydraulic valves makes it simple to add additional valves for hydraulic attachments. All service points are conveniently accessible.

Write for complete information:

Baker handling equipment

THE BAKER-RAULANG COMPANY

1227 WEST 80th STREET • CLEVELAND 2, OHIO

A subsidiary of Otis Elevator Company

5E4

fatigue cracks

by William M. Coffey

New Faces

When your ffj starts on its second century next January it will celebrate by blossoming out with a brand new front cover.

Want to see how it'll look? Turn to p. 156. Go ahead, tear yourself away, p. 156. Aw c'mon, p. 156. Look, the boss is watching, will you *please* turn to p. 156.

Pretty lively, hah? Powers that be around here tell us the new front cover will make your ffj even more useful to you. You'll be able to recognize it faster, have less chance of missing important features when they're listed right smack on the cover. Of course *we* know who's *really* useful around here.

Reprints Available

You have a good chance today to learn something about something very close to our heart — money, and how to save it. Almost everything you want to know about how to save money on your purchases of steel you'll find in this special Metal Show issue of your ffj. This has been one of our larger efforts to date. Perhaps you thought, understandably enough, that we had shot our bolt this year with the monumental anniversary issue, "100 Years of Metalworking" or the Machine Tool Show issue. If you did, you don't know our editors. So that it is not really a surprise to us that so soon on the heels of "100 Years" they can also produce such a useful issue as this one.

Because we believe that you'll read the print right off the pages of this issue, we are making reprint copies available. So, if you want an extra copy or so just drop us a small note. We are prepared to happily furnish same.

Every department, every function in metalworking is vitally concerned with the problem of efficient purchasing and use of steel. So there's information here for you, the top administrative executive; for you, the purchasing agent; for you, the plant engineer or for you, the production manager or for me, the acting corporal.

Caleb Flerk's Own Story (Conclusion)

Here ends the first serialized fiction ever run in The Iron Age. We're not giving you a synopsis of what went on before this time because in the serialized fiction field you just don't do that with the conclusion.

Well, Mr. Marc arty, thats my story on bein a man of over average intelligents an unlimited patience, i have gave a considdurible mount of thought to this insident and i guess i dont need leave yours imagination further guess how dissapoint i am regards yore arrplane. I cant help but think of all them other people who put their strickest connfidents in them machines an 1st thing you know somebody's gonna get his head tore out before he knows what hit him. Therefore an since you are the service manager of this here Chancy sikorsr corsehair company i feel you have a very responsible service to perform to all them people who may be desirous to fly yore arrplane. Ive bin setting out onto the back stoop for hours on end figgerin this thing out an watchin all the birrds akin to this country real careful-like. Ive been watched them when they dident know i was watchin them and this inkloods wrens, sparrers, jaybirds, hawks, doves, crows an woddy peckers. My advice to you Mr. McArty is for you to tell them big smart enjineers up to yore place to spend more time outside doin jist what ive bin doin cause it wont take any fool long to see thet them birds would jist as likely bust their head too if some idiot had stuck thir wings on upside down too.

Indigently,
Caleb Flerk

now you can produce trouble-free,

FREE-MACHINING STEEL with FOOTE MANGANESE SULPHIDE

This fume-free ladle additive increases quality and reduces the cost of producing high sulphur, free-machining steels . . . with these plus advantages:

1. *improved hot rolling behavior*
2. *fewer surface defects*
3. *fewer diversions*
4. *lower conditioning costs*
5. *low carbon content saves heat time*

TYPICAL ANALYSIS	
Manganese	53%
Sulphur	32%
Carbon	.22%

Size: 1" x 5" lump

write for further details!

Foote MINERAL COMPANY

438 Eighteen W. Chelten Bldg.
Philadelphia 44, Pa.

Now Available
to American Industry
the First
Air-Powered Strapping Machine

OUTSTANDING FEATURES

- Air power does the hard work—fast
- Tension is just right every time
- Field-tested dependability
- Light weight, portable

For ⅜" and ¼" Signode strapping; automatic seal-feed magazine holds 75 seals; tension adjustable to 1600 pounds.

For more information, write

SIGNODE Steel Strapping Co.

2623 N. Western Ave., Chicago 47, Ill.

Offices coast to coast—Foreign subsidiaries and distributors world-wide
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto

dates to remember

OCTOBER

SOCIETY OF AUTOMOTIVE ENGINEERS—National Aeronautic meeting, Oct. 11-15, Hotel Statler, Los Angeles. Institute headquarters, 29 W. 39th St., New York 18.

FOUNDRY EQUIPMENT MANUFACTURERS ASSN.—Annual meeting, Oct. 13-15, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters, 1008 Engineers Bldg., Cleveland.

METAL TREATING INSTITUTE — Annual Meeting, October 14-16, Warwick Hotel, Philadelphia. Institute headquarters are at 271 North Ave., New Rochelle, N. Y.

CONVEYOR EQUIPMENT MANUFACTURERS ASSN.—Annual meeting, Oct. 15-18, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters, No. 1 Thomas Circle, Washington, D. C.

EXPOSITIONS

1955

NATIONAL METAL CONGRESS AND EXPOSITION—Oct. 17-21, Philadelphia.

1956

ASTE—Industrial exposition, March 19-23, Chicago.

MATERIALS HANDLING SHOW, June 5-8, Cleveland.

AMERICAN GAS ASSN.—Annual convention, Oct. 17-19, Los Angeles. Association headquarters, 420 Lexington Ave., New York.

AMERICAN INSTITUTE OF MINING & METALLURGICAL ENGINEERS—Annual fall meeting, Institute Metals Div., Oct. 17-19, Adelphia Hotel, Philadelphia. Institute headquarters, 29 W. 39th St., New York.

AMERICAN WELDING SOCIETY—National fall meeting, Oct. 17-21, Philadelphia. Society headquarters, 33 W. 39th St., New York.

THE GRAY IRON FOUNDERS' SOCIETY—27th Annual meeting, Oct. 19-21, Schroeder Hotel, Milwaukee. Institute headquarters, 930 National City-East Sixth Bldg., Cleveland 14.

AMERICAN GEAR MANUFACTURERS ASSN. — Semi-annual meeting, Edgewater Beach Hotel, Oct. 23-26, Chicago. Institute headquarters, No. 1 Thomas Circle, Washington 5, D. C.

RAIL STEEL BAR ASSOCIATION—74th meeting, Oct. 24-25, Sherman Hotel, Chicago. Association headquarters, 38 South Dearborn St., Chicago.

STEEL FOUNDERS' SOCIETY OF AMERICA—Annual fall meeting, Oct. 24-25, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 606 Terminal Tower, Cleveland.

Here's what a cautious company learned about NORTH CAROLINA

"The test operations we started two years ago in our pilot plant were so successful and the work of the people we employ so satisfactory we decided to purchase the building we were renting and enlarge our operation here."
Statement by the president —company name on request

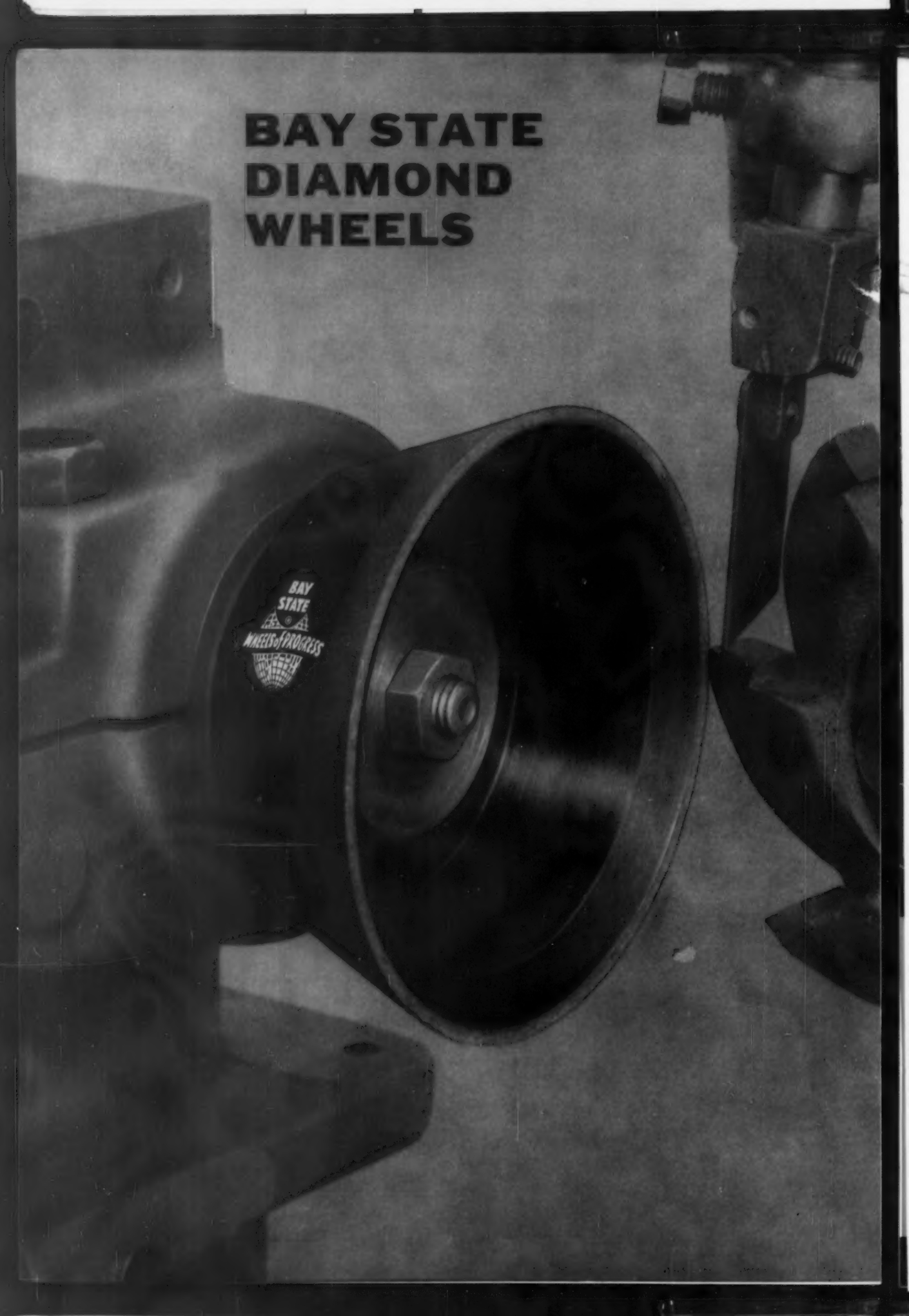
Experiences like the one above explain why so many companies select not just one site but second and multiple locations in North Carolina, the South's leading industrial State.

These are diversified industries — ranging from Aircraft to Zippers, large companies and small, with many different operating problems and requirements. In every case, though, efficient production and cooperative labor are outstanding reasons for satisfaction in North Carolina.

Investigate the opportunities for your company in this State, for early action or long range planning. Statewide information is easily obtained by just a letter or call to Ben E. Douglas, Director, Department of Conservation and Development, Raleigh 11, N. C.

Friendly North Carolina Where Industry Prospers

A ready-to-mail brochure with data about power, water, taxes, labor, etc., is yours for the asking.


BAY STATE
DIAMOND
WHEELS
BAY
STATE
WHEELS of PROGRESS

for ALL YOUR TOOL GRINDING NEEDS

BAY STATE's complete line of diamond wheels offers the *correct* shape and specification to meet your exacting tool grinding requirements.

For example, BAY STATE'S new "BA" resinoid bond in the flaring cup wheel illustrated provides:

- Excellent corner holding qualities for grinding accuracy and maximum wheel life.
- Both dry and wet grinding from the same wheel.
- Ability to grind both carbide and steel where steel cannot be backed-off.
- High heat resistance to maintain bond strength, sharp, cool cutting, and top wheel efficiency.

This is one more illustration of better grinding engineered by BAY STATE in its outstanding "Wheels of Progress" program.

Call on your local BAY STATE DISTRIBUTOR, *he's a key man on all grinding problems. Ask him for the latest Diamond Wheel Handbook which includes net prices in all bonds: Vitrified, Metal, Resinoid.*

BAY STATE ®
WHEELS of PROGRESS

BAY STATE ABRASIVE PRODUCTS CO.,
Westboro, Mass., U.S.A.

Branch Offices and Warehouses — Bristol, Conn.; Chicago, Ill.; Cleveland, Ohio; Detroit, Mich.; Pittsburgh, Pa.
Distributors — All principal cities
In Canada: Bay State Abrasive Products Co. (Canada) Ltd., Brantford, Ont.

Manufacturers of all types of Quality Abrasive Products

Bale It the G-H Way...

Salvage Your Sheet Metal Scrap At Lowest Cost-per-Ton

For many years, leaders of U. S. industry have depended upon Galland-Henning Balers and Galland-Henning Counsel for profitable solution of their sheet metal salvage problems. If your plant generates an appreciable volume of sheet metal scrap per day, chances are that a G-H Baler of proper size and capacity will prove a profitable investment for you.

Galland-Henning Hydraulic Balers are powerful, rugged and fast. They are engineered and constructed with just one thought in mind . . . to produce dense, compact, mill-sized bales at lowest possible cost-per-ton. That means profitable scrap salvaging for you, and more good, usable scrap metal for the mills, smelters and foundries.

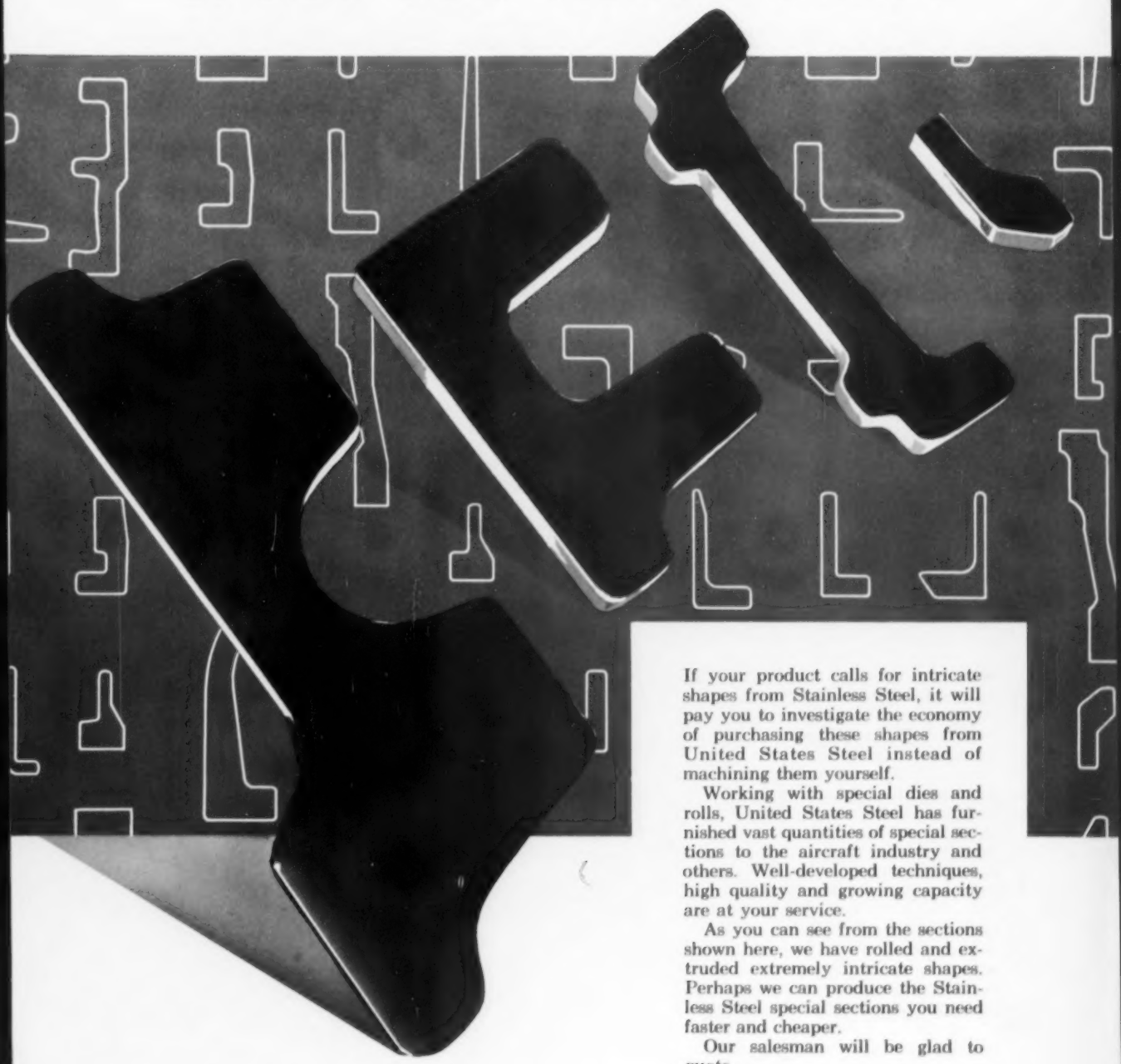
Make Galland-Henning your Headquarters for Competent Scrap Baling Counsel.

GALLAND-HENNING MFG. COMPANY
2725 SOUTH 31ST STREET • MILWAUKEE 46, WISCONSIN

GALLAND-HENNING
SCRAP METAL BALING PRESSES

A 7472-1P

You can save machining costs with special sections–rolled or extruded of **USS STAINLESS STEEL**



If your product calls for intricate shapes from Stainless Steel, it will pay you to investigate the economy of purchasing these shapes from United States Steel instead of machining them yourself.

Working with special dies and rolls, United States Steel has furnished vast quantities of special sections to the aircraft industry and others. Well-developed techniques, high quality and growing capacity are at your service.

As you can see from the sections shown here, we have rolled and extruded extremely intricate shapes. Perhaps we can produce the Stainless Steel special sections you need faster and cheaper.

Our salesman will be glad to quote.

USS STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

USS

UNITED STATES STEEL CORPORATION, PITTSBURGH
AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION,
WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

"Forgings stay straight as an arrow in these furnaces"

says
Clair J. Koehler,
U. S. Steel Heater

OUR HOMESTEAD FORGINGS DIVISION has the most modern heat treating facilities available to accommodate the most critical forging specifications.

These vertical furnaces, for example.

These furnaces permit the ultimate in temperature control and completely eliminate any possibility of distortion even when heating forgings, such as the turbine rotor shown, to temperatures as high as 1830°F!

Why did we install these furnaces?

Clair Koehler, a heater for 15 of his 31 years with us, can answer. "Large shafts stay straight as an arrow in these verticals. We get better temperature control, too. Total temperature variation is less than 10°F. from top to bottom."

Such laboratory-type precautions are typical of the care all forgings receive at United States Steel.

Address inquiries or requests for our free 32-page booklet on USS Quality Forgings to United States Steel, Room 4968, 525 William Penn Place, Pittsburgh 30, Pa.

UNITED STATES STEEL

SEE THE UNITED STATES STEEL HOUR. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

UNITED STATES STEEL

USS

Quality FORGINGS

- heavy machinery parts—carbon, alloy, stainless
- forged steel rolls and back-up roll sleeves
- electrical and water wheel shafts
- hammer bases and columns

other week by United States Steel. Consult your local newspaper

STEEL

50-ton crane becomes 85-ton crane

with no increase in size

United States Steel's Edgar Thomson Works in Braddock, Pennsylvania, needed new and heftier crane equipment to handle larger ladles. One requirement was four new crane trolleys which were to operate on the same bridges, if possible, and in exactly the same clearances as before.

The trolleys had to be stronger but no larger than before; so ordinary steel wouldn't do. Needed, was a steel of *exceptional strength* which could be *welded easily*. Lots of alloy steels could have met the strength requirements; but USS "T-1" Steel was the *only* steel that could supply not only the required strength, but good weldability as well.

"T-1" Steel plate—in ¾" and 1" thicknesses—was used in box girders and lateral stiffener plates of the trolleys. This change increased the crane capacity from 50 to 85 tons with no increase in size.

The structure was welded with AWS E12015 electrodes. It was as easy as welding carbon steel. No stress relief was needed. And the welds developed the full yield strength of the steel: 90,000 psi. minimum.

Remember this story when you must weld very high strength parts —parts that must operate at temperatures as high as 900°F. or as low as 40°F. below zero, parts that must withstand tremendous impact abuse, abrasion or tensile stress. Then consider USS "T-1" Constructional Alloy Steel. For full particulars write: United States Steel, Room 4968, Pittsburgh 30, Pa.

UNITED STATES STEEL CORPORATION, PITTSBURGH · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. · UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

SEE THE UNITED STATES STEEL HOUR. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

USS "T" CONSTRUCTIONAL ALLOY STEEL

USS

UNITED STATES STEEL

No More Scaling Here.....
Despite Severe Oxidizing Conditions

A vibrating chute made of a HAYNES high-temperature alloy solved a tough maintenance problem in this heat-treating furnace. The chute spans the entrance to the furnace and is subjected to severe oxidizing conditions. Other chutes became loaded with heavy scale in a few months' time and had to be repaired or replaced. Now that the chute is made of a HAYNES high-temperature alloy, there is no more scale. Parts keep flowing along freely, rejections are way down, and maintenance has been practically eliminated.

There are 11 HAYNES high-temperature alloys. All have excellent strength at elevated temperatures, good creep and stress-rupture properties, and are extremely resistant to oxidizing or reducing atmospheres. One of them may be the answer to a production or maintenance problem in your plant.

For information on prices, sizes, and properties of these alloys, write to our general sales office in Kokomo, Indiana, or to any of the district sales offices listed below.

HAYNES TRADE-MARK ALLOYS

HAYNES STELLITE COMPANY

A Division of Union Carbide and Carbon Corporation

UCC

General Offices and Works, Kokomo, Indiana

Sales Offices

Chicago · Cleveland · Detroit · Houston · Los Angeles · New York · San Francisco · Tulsa

"Haynes" is a registered trade-mark of Union Carbide and Carbon Corporation.

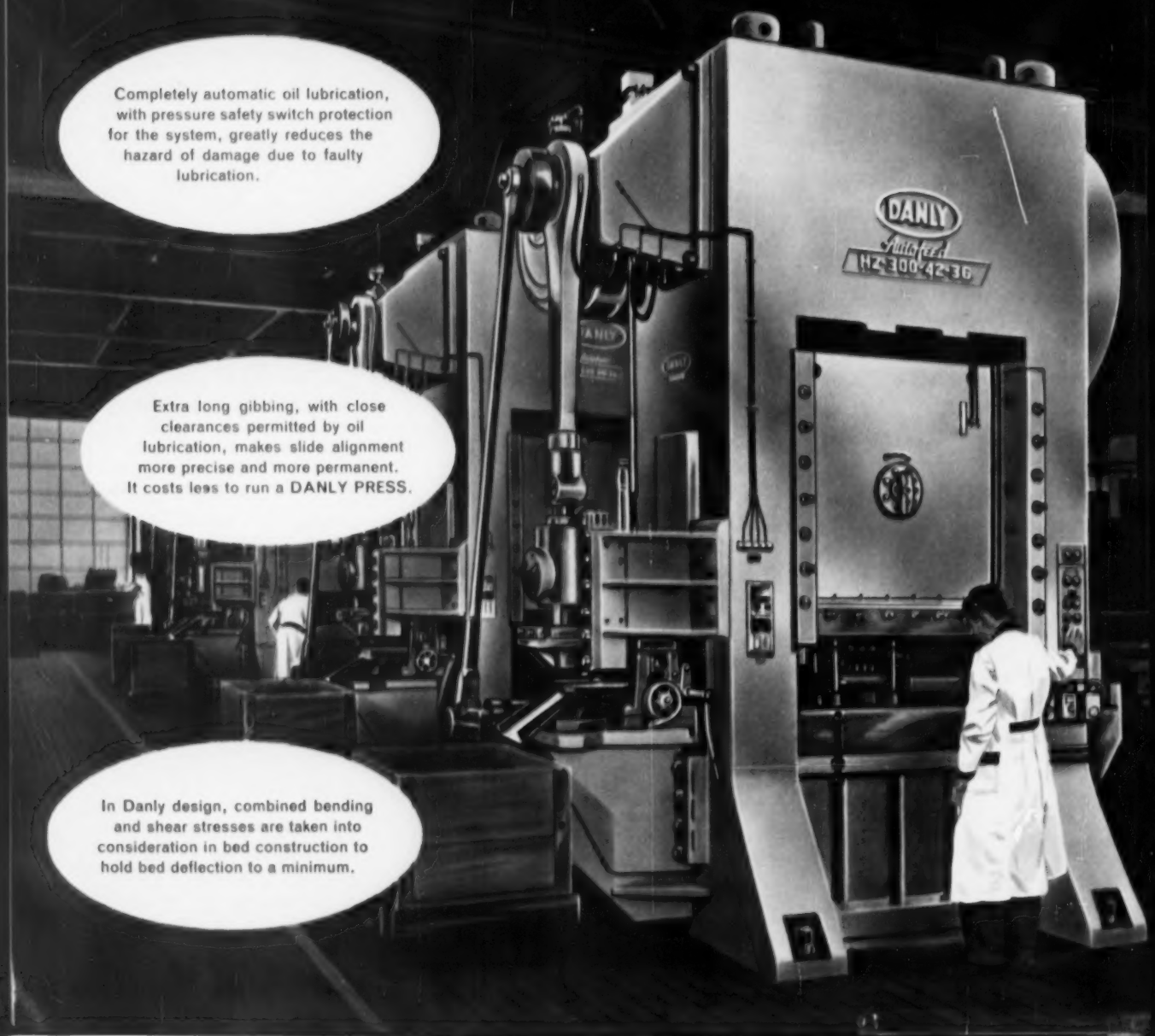
comparison proves

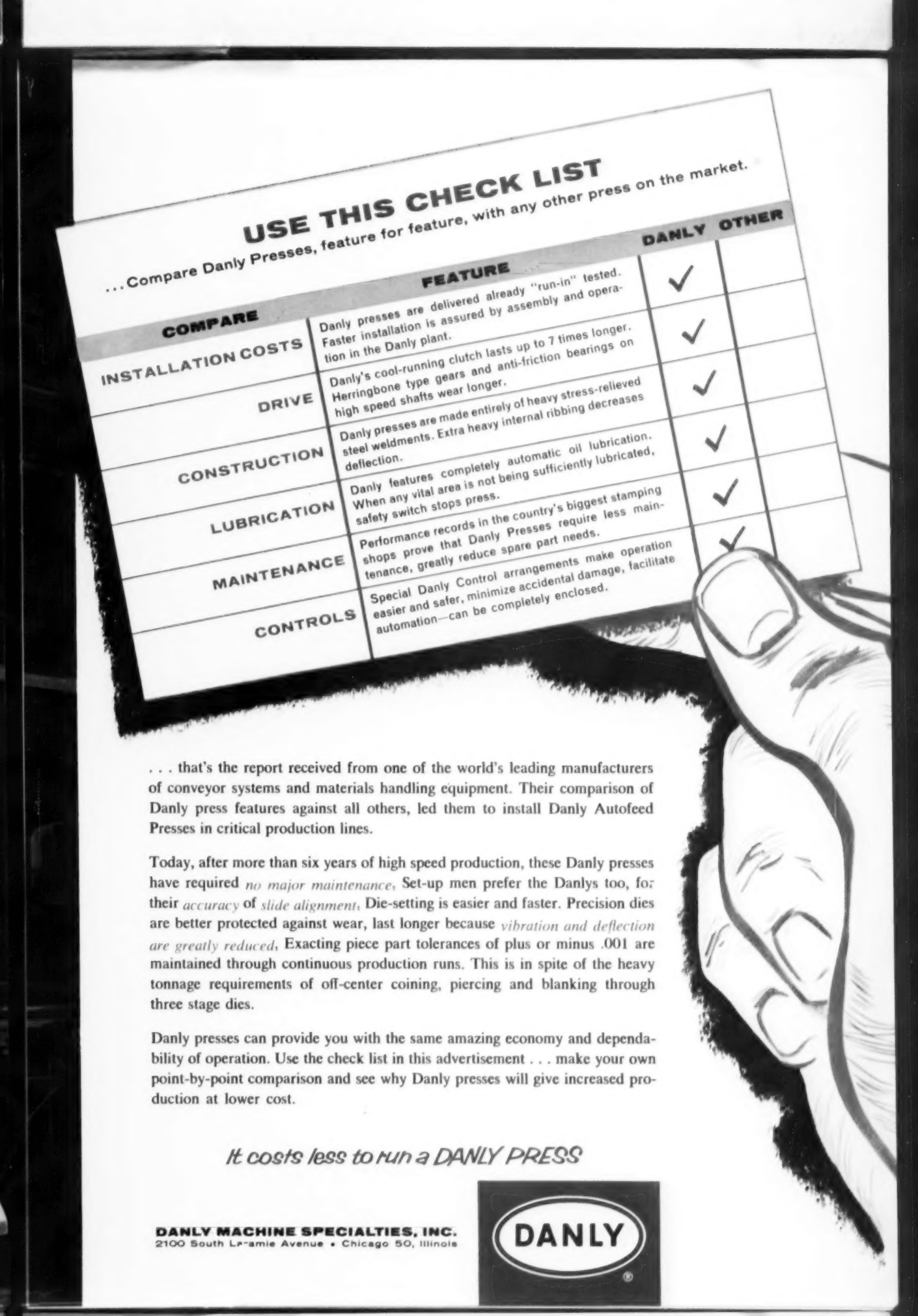
DANLY AUTOFEED PRESSES MAKE HIGH PRODUCTION DIES LAST LONGER

Completely automatic oil lubrication, with pressure safety switch protection for the system, greatly reduces the hazard of damage due to faulty lubrication.

Extra long gibbing, with close clearances permitted by oil lubrication, makes slide alignment more precise and more permanent. It costs less to run a DANLY PRESS.

In Danly design, combined bending and shear stresses are taken into consideration in bed construction to hold bed deflection to a minimum.




USE THIS CHECK LIST
...Compare Danly Presses, feature for feature, with any other press on the market.
COMPARE
FEATURE
DANLY
OTHER
INSTALLATION COSTS
Danly presses are delivered already "run-in" tested. Faster installation is assured by assembly and operation in the Danly plant.
DRIVE
Danly's cool-running clutch lasts up to 7 times longer. Herringbone type gears and anti-friction bearings on high speed shafts wear longer.
CONSTRUCTION
Danly presses are made entirely of heavy stress-relieved steel weldments. Extra heavy internal ribbing decreases deflection.
LUBRICATION
Danly features completely automatic oil lubrication. When any vital area is not being sufficiently lubricated, safety switch stops press.
MAINTENANCE
Performance records in the country's biggest stamping shops prove that Danly Presses require less maintenance, greatly reduce spare part needs.
CONTROLS
Special Danly Control arrangements make operation easier and safer, minimize accidental damage, facilitate automation—can be completely enclosed.

. . . that's the report received from one of the world's leading manufacturers of conveyor systems and materials handling equipment. Their comparison of Danly press features against all others, led them to install Danly Autofeed Presses in critical production lines.

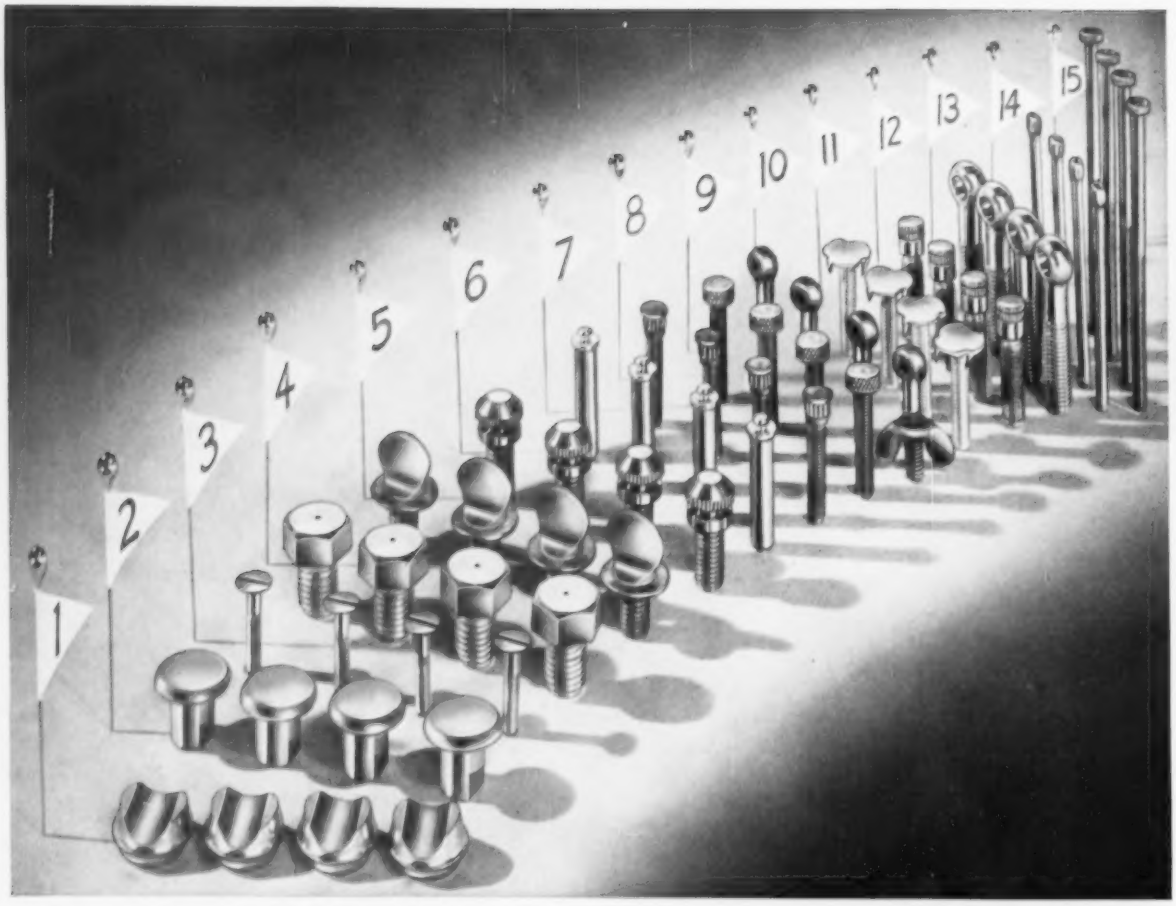
Today, after more than six years of high speed production, these Danly presses have required *no major maintenance*. Set-up men prefer the Danlys too, for their *accuracy* of *slide alignment*. Die-setting is easier and faster. Precision dies are better protected against wear, last longer because *vibration and deflection are greatly reduced*. Exacting piece part tolerances of plus or minus .001 are maintained through continuous production runs. This is in spite of the heavy tonnage requirements of off-center coining, piercing and blanking through three stage dies.

Danly presses can provide you with the same amazing economy and dependability of operation. Use the check list in this advertisement . . . make your own point-by-point comparison and see why Danly presses will give increased production at lower cost.

It costs less to run a DANLY PRESS

DANLY MACHINE SPECIALTIES, INC.
2100 South Laramie Avenue • Chicago 50, Illinois

DANLY®



This Army of Specials Marches to Save You Money

Here are a few of the many specials produced by Harper to save industry money—to do a better job.

Many used to be milled from bar but Harper engineers and metallurgists developed methods of cold-forming them with these results:

- Important savings in cost
- Faster production
- No metal wasted
- Usually a cleaner, stronger, better finished product

If you are using parts like these of any metal other than plain steel in quantity, it will pay you to check with Harper no matter how you are producing them.

Remember also that Harper is the largest manufacturer specializing in standard bolts, nuts, screws, washers and rivets of all non-ferrous metals and stainless steel. Stocks available in every market area for immediate delivery. Check the Harper branch or distributor near you.

THE H. M. HARPER COMPANY
8215 Lehigh Avenue, Morton Grove, Ill.

Specialists in all corrosion-resistant fastenings

Bolts • Nuts • Screws • Rivets • Washers
of
Brass • Bronze • Monel • Aluminum • Stainless

1. Copper Contact
2. Copper Lead
3. Brass Hi-torque Brake Band Bolt
4. Aluminum Hex Head Air Pressure Bolt
5. Silicon Bronze Transformer Adjusting Screw
6. Silicon Bronze Terminal
7. Stainless Steel Groove Pin
8. Silicon Bronze Molded Plastic Insert
9. Stainless Steel Focusing Screw
10. Stainless Steel Hinge Pin
11. Brass Hold-down Screw
12. Brass Terminal Block Screw
13. Monel Eye Bolt
14. Copper Conductor Pin
15. Stainless Steel Hex Head Stem Bolt

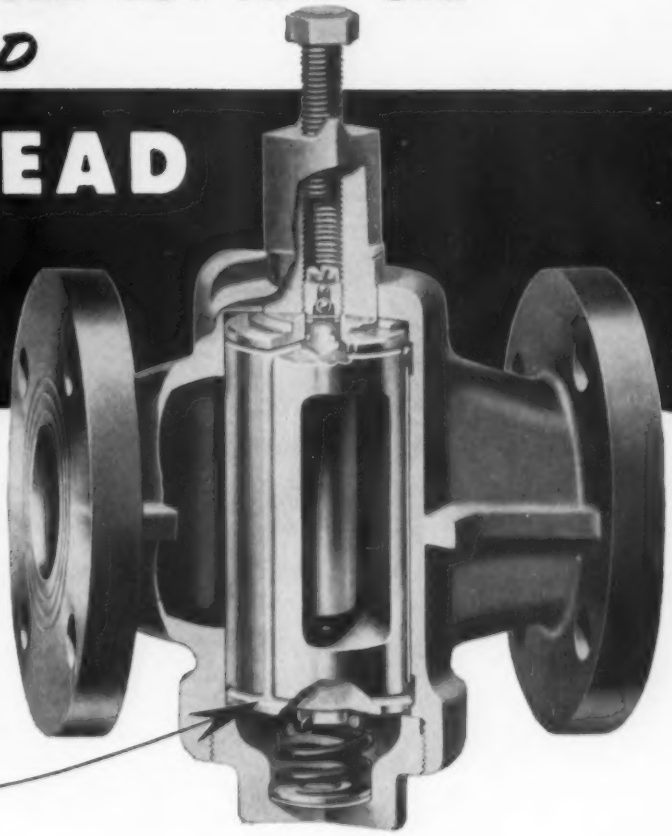
OVER 7000 ITEMS IN STOCK...HARPER DISTRIBUTORS EVERYWHERE

HARPER
EVERLASTING FASTENINGS

2100 South LaSalle Avenue • Chicago 50, Illinois

DANLY®

No. 5* of 12 REASONS WHY
YOU SHOULD BUY AND USE
LOW-PRICED
HOMESTEAD
Lubricated
PLUG VALVES



*SELF-FREEING PLUG PREVENTS STICKING

Homestead's exclusive completely controlled lubricant system positively prevents sticking by its instant, piston-like movement of the plug downward at the start of each lubrication. Spring and line pressure return it to stem-sealed position.

This is only **one reason why you should buy and use low-priced** HOMESTEAD LUBRICATED PLUG VALVES.

HERE ARE ALL TWELVE

1. Extra long valve life assured by very close tolerance between sealing surfaces.
2. Straight line fluid flow—streamlined ports—minimum resistance to flow—minimum pressure drop.
3. Triple head seal—two lubricant rings and reinforced Teflon stem seal prevent leakage.
4. Easy turning—plug floated on Teflon washer and reinforced Teflon ring.
5. Leak-proof double ball and lubricant sealed check valve. No springs. No maintenance.
6. Full-threaded screw prevents dirt being forced into lubricant system.
7. Quarter-turn fully opens or closes.
8. Reinforced Teflon stem seal—no cold flow—continuous, positive seal.
9. Seating surfaces protected in both open and closed positions.
10. High pressure lubricant system provides full lubricant seal around ports.
11. Self-freeing plug prevents sticking.
12. Two lubricants handle most services.

FOR CATALOG AND COMPLETE DETAILS MAIL COUPON TODAY

HOMESTEAD
VALVE MANUFACTURING COMPANY
"Serving Since 1892"

P. O. Box 23 **Coraopolis, Pa.**

Without obligation, send Reference Book 39—Section 5 on HOMESTEAD LUBRICATED PLUG VALVES.

NAME_____ TITLE_____

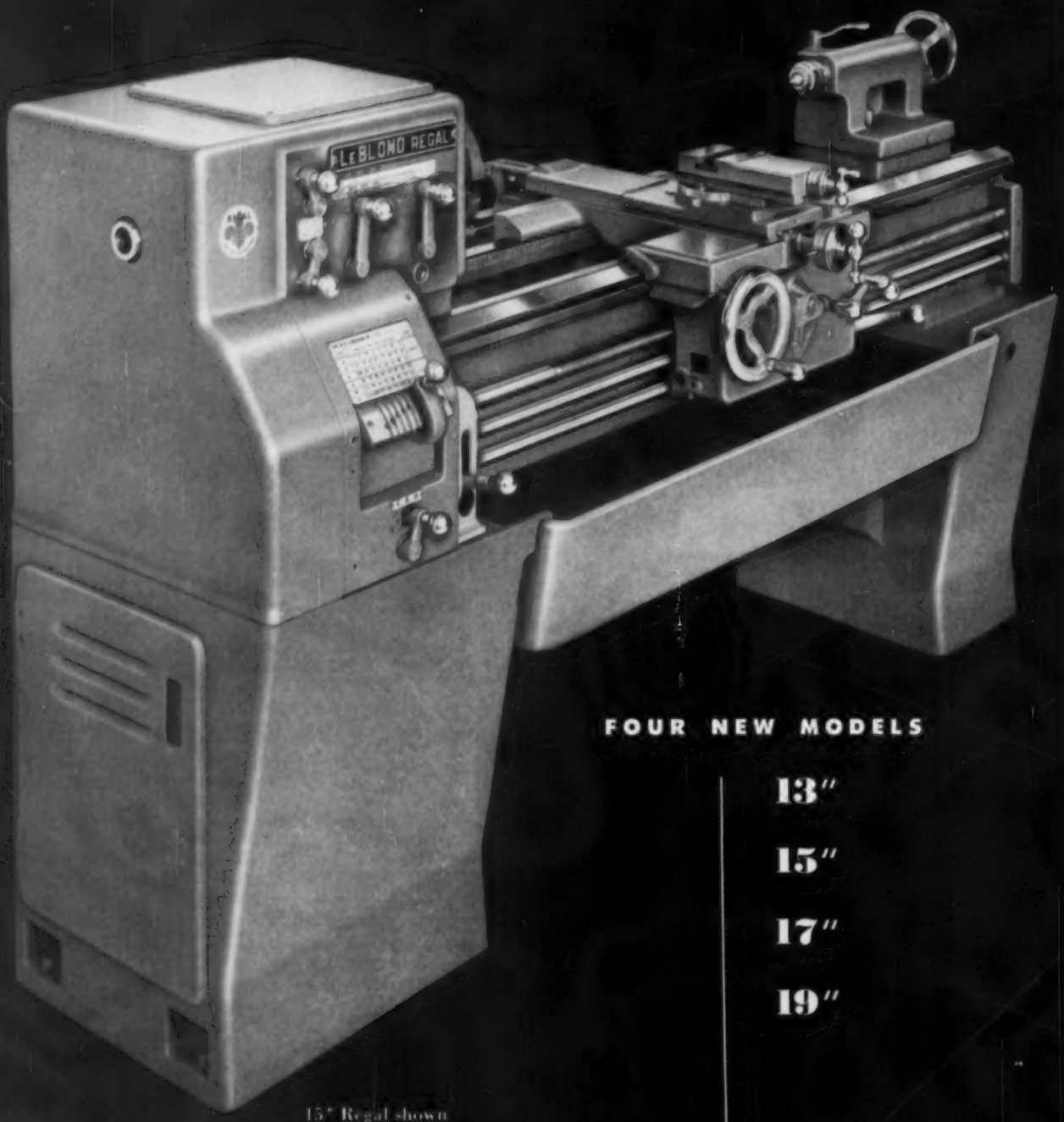
COMPANY_____

ADDRESS_____

CITY_____ STATE_____

cut with confidence . . .

HERE'S THE



15" Regal shown

FOUR NEW MODELS

13"

15"

17"

19"

NEW LeBLOND REGAL

The only lathe in its class with so many big-lathe features

Designed and built like heavy-duty lathes, the new LeBlond Regals will give you long life of precision production, minimum maintenance and the kind of dependability you'd expect from a much higher-priced machine!

Consider, for example, the new Regal headstock. It uses the same combination gear-belt drive construction that proved itself on the famous LeBlond Dual-Drive and is now incorporated on our new 16" heavy-duty lathe. Then take a look at the new bed with hardened and ground replaceable steel ways. Like the ways on our heavy-duty machines, they are fitted according to the compensating veeway principle to insure better distribution of forces for proven long-time accuracy and minimum wear.

Again, like higher-priced lathes, Regals are equipped with *both* feed rod and leadscrew for continued accuracy in thread chasing. Other big-lathe features—3-bearing spindle. Automatically lubricated quick-change box. Wide carriage bridge with ample bearing surface. Rugged tailstock with plug clamping. Plus general dimensions and construction details patterned after LeBlond heavy-duty lathes.

Only from the builder of a complete line of lathes can you get a low-priced lathe with true big-lathe features. All of LeBlond's 68 years of experience has gone into the design and building of these new Regals. Be sure you get all the details; see your LeBlond Distributor or write for Bulletin R-200-C.

	13"	15"	17"	19"
Swing over bed and carriage wings	14"	15½"	17¼"	19¼"
Spindle speeds, number	12	12	12	12
Spindle speed range, rpm.	45 to 1800	30 to 1200	38 to 1500	25 to 1000
Feeds and threads, number	48	48	48	48
Feed, range, in. per rev.	.0018—.106		.002—.116	
Threads per inch, range	4—224		2—112	
Horsepower	2	3	3	5

. . . cut with confidence

THE R. K. LEBLOND MACHINE TOOL COMPANY
CINCINNATI 8, OHIO

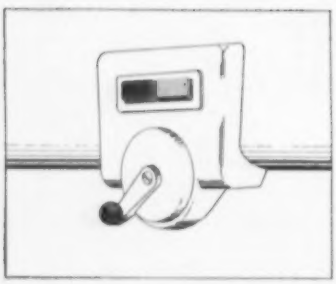
LeBLOND of Cincinnati

WORLD'S LARGEST BUILDER OF A COMPLETE LINE OF LATHES • FOR MORE THAN 68 YEARS

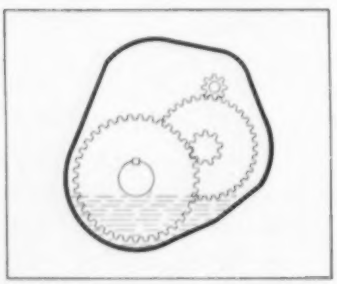
2 New CINCINNATI PRESS BRAKES

THIRTY TON - - - - - 2-30 SERIES
FIFTY TON - - - - - 3-50 SERIES

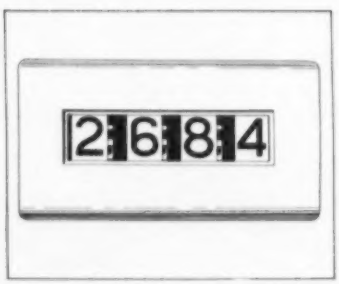
COMPETITIVELY PRICED



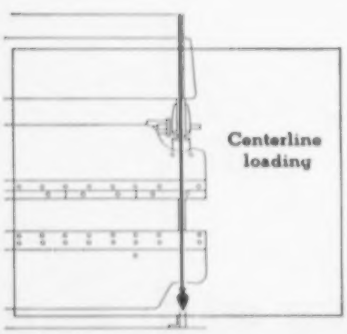
Front controlled, variable speed drive, 20 to 50 strokes per minute.



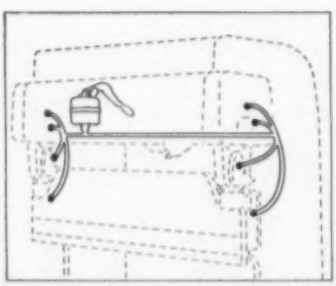
Completely enclosed transmission, running in oil.



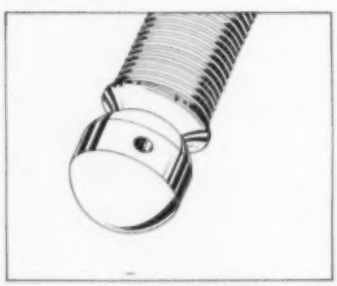
Two micrometer indicators, one at each end of the ram—easy to read and accurately record the amount of adjustment and tilt.



Centerline loading prevents weaving of the housings and insures accurate bends.



Centralized pressure lubrication system.



Ball end on the ram adjusting screws permits tapering of the ram for fade-out work.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

2-30 SERIES

This new 2-30 Series Cincinnati All Steel Press Brake has a capacity of 14 gauge x 6′ mild steel.

Look at these unusual standard features:

2½″ stroke—12″ shut height—9″ throat.

Distance between housings 5′-2″—overall die surface, 6′-0″.

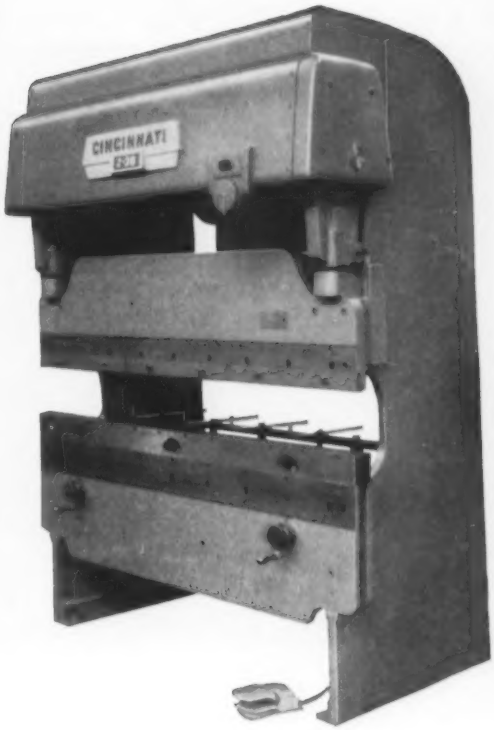
Front controlled, variable speed drive, 20 to 50 SPM. 4″ manual ram adjustment including ram tapering adjustment for fade-out work (power adjustment available as extra feature).

Bronze swivel end-guide bearing for accurate endwise alignment, even when tilting ram.

Brushless electro-magnetic brake and clutch.

Deep bed and ram, planed and drilled for 5¾″ angles.

Micrometer indicators on both ends of ram for fast, accurate setting.



3-50 SERIES

These new 3-50 Series Cincinnati All Steel Press Brakes are built in two lengths and have a capacity of 10 gauge x 6′ mild steel. Investigate these unusual standard features: 3″ stroke—12″ shut height—12″ throat—distance between housings 6′-6″ or 10′-6″—overall die surface 8′-0″ or 12′-0″—front controlled, variable speed drive, 20 to 50 SPM.

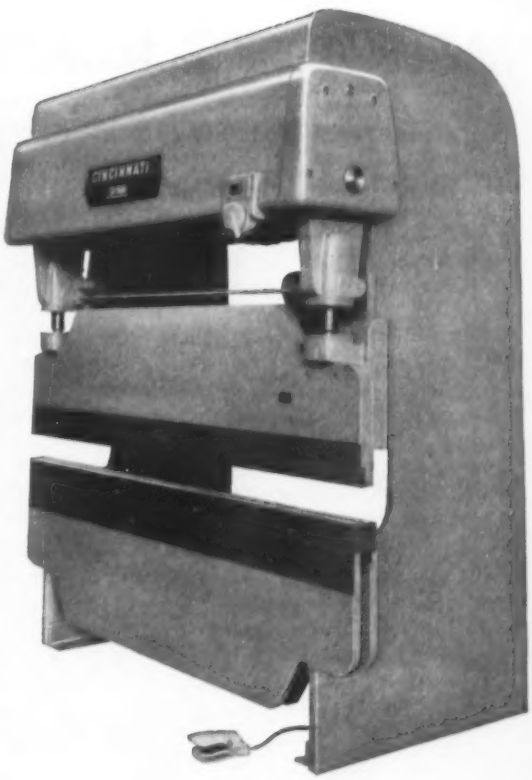
5″ motorized ram adjustment, including ram motor and control, complete with ram tapering adjustment for fade-out work.

Bronze swivel end-guide bearing for accurate endwise alignment, even when tilting ram.

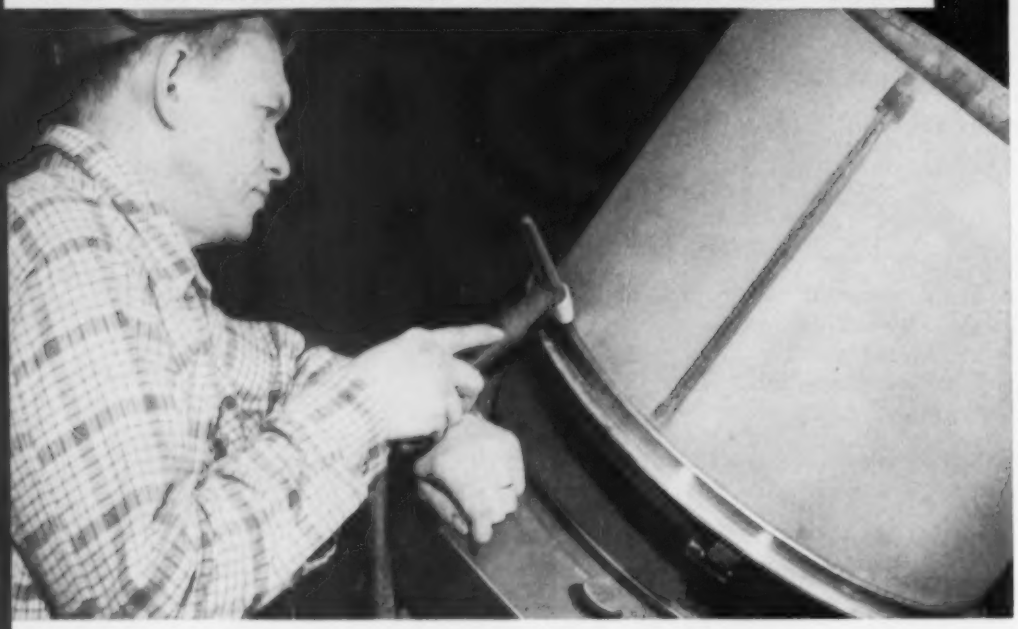
Brushless electro-magnetic brake and clutch.

Deep bed and ram, planed and drilled for 5¾″ angles.

Micrometer indicators on both ends of ram for fast, accurate setting.



HOW CAN THESE SKILLS OF SMALL BUSINESS HELP YOU?



JET ENGINE tail pipe is welded by Howard Sanders, foreman of General Tool's fabrication department. Typical of the initiative of many small businessmen, General Tool found a way to reduce costs in this fabrication work.

How skills developed on G-E defense subcontracts helped a small business expand production capacity

General Tool Company's steady growth, first stimulated by G-E orders for jet engine parts, offers opportunities for service to other manufacturers.

William Kramer and Harold Poe did a $1,500,000 business in Reading, Ohio, last year—50% more than their total for 1953. That's a healthy growth picture for their General Tool Company. Even more important, this growth is a sure sign of the company's value to the country, as it keeps the firm's defense potential high.

Why? Because General Tool grows bigger every year by using the skills and capacity it developed in handling G-E orders for jet engine parts. In adapting these skills to non-defense items, the company is prepared to work for other manufacturers, and, at the same time, preserves its role as a vital defense producer should the need ever arise.

BIG AND SMALL BUSINESS WORK TOGETHER. General Tool's story is an outstanding example of the results when big and small business help each other out. And Kramer and Poe were *very* small when they started in 1947. They had a bank loan, personal savings, and a corn field on the edge of town. They put up a 32′ x 70′ building, hired 6 men and went to work.

"Best break we got," partner Kramer volunteers, "was a G-E defense subcontract to make parts for jet engines. And because of the high-quality product demanded by General Electric," he says, "we hired expert personnel, bought better equipment—became a better company making finer products with faster deliveries."

TODAY, GENERAL TOOL'S PRODUCTION ranges from paper mill machinery to complex control devices for automobile assembly lines. The company's additional capacity, brought about in part by the stretch out of defense orders from the Korean peak, is fast being put to work on peacetime production. Such success in these times of change shows that when large and small businesses work with each other to produce for defense, they can also stimulate economic development in peacetime.

649-2

Progress Is Our Most Important Product

GENERAL ELECTRIC

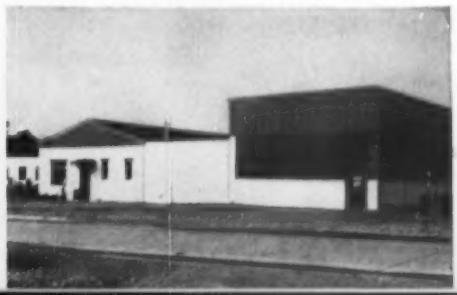
SMALL BUSINESS OWNERS, Harold S. Poe, left, and William J. Kramer, right, started as a partnership in 1947 with 6 employees. Now, as vice-president and president respectively, they employ 112.

MORE ACCURACY on all products resulted from G.E.'s rigid requirements. Here, R. Klausing, foreman, uses precision machine specially designed by General Tool designer working with G-E engineers.

EXPANSION of General Tool Company was rapid to handle G-E subcontracts. Engineers, above, hired to handle defense work, now design tools and machines for variety of non-defense uses.

IN CORNFIELD, on outskirts of Reading, partners started the business—used personal savings, plus a bank loan to buy property, erect a 32′ x 70′ building. Total sales in 1948 were $60,268.31.

TODAY'S PLANT covers 30,000 square feet of floor space, has 112 employees, did a $1,500,000 business in 1954 and continues ready for defense production if required.

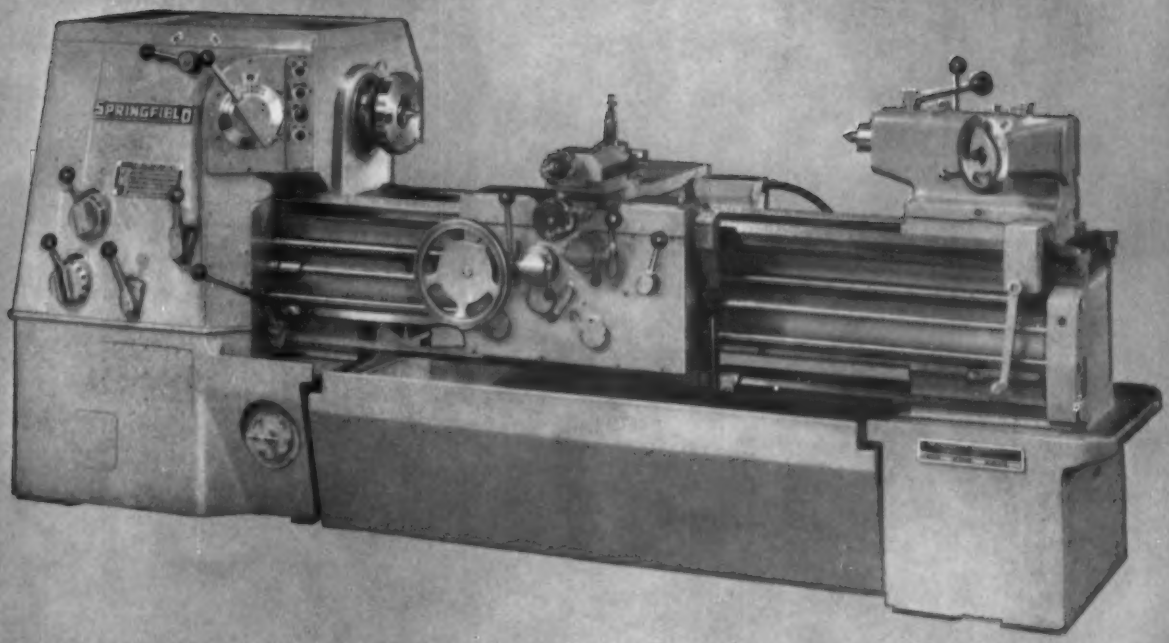


CAN SMALL BUSINESSES HELP YOU?

Thousands of small businesses, like General Tool Co., have furnished General Electric with practically every kind of skill and service as defense subcontractors and suppliers. Many of these companies have available production capacity, created in large part by the reduction of defense orders since the Korean War peak. This means that they may be able to apply their skills to help you with your production.

If you have a manufacturing problem or have work available for subcontracting, please write us on your letterhead stating in as much detail as possible the type of services or skills you require. We will be glad to suggest several small businesses who have done similar work for us and may be able to help you. Write to C. W. Bryant, Manufacturing Services Division, General Electric Co., 570 Lexington Ave., New York 22, New York.

SPRINGFIELD



more useful horsepower

All the horsepower in a Springfield Model "S" Lathe is productive.
A simple, straight-forward gear train, plus double-action lubrication, plus tight dynamic balance tolerances (.0005" displacement) eliminate friction and vibration, the twin horsepower thieves.
In the headstock, only the gears necessary to a given speed are engaged. Other gears run free with a stabilizing flywheel action, no drag on power.
A high pressure filtered oil mist keeps all gears and bearings drenched, and a cascade of oil lubricates the feed box.

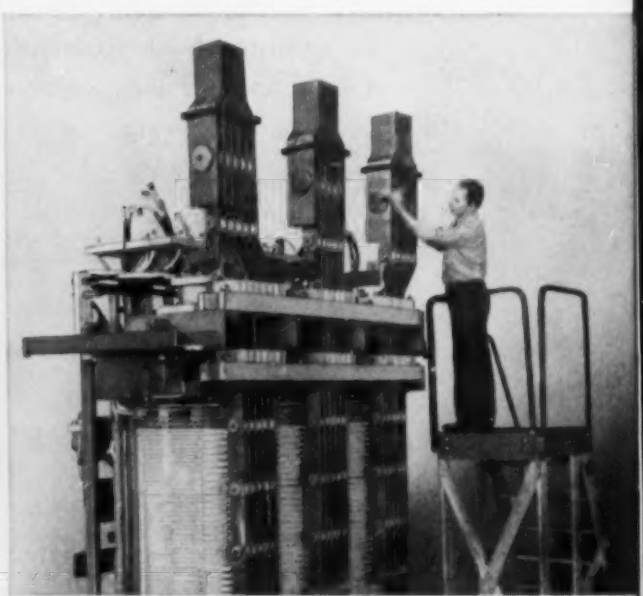
Lathes: Engine and tool room, contouring and reproducing—swings 14" to 32".
Vertical Universal Grinders: swings 18" to 42".

The Springfield Machine Tool Company
Springfield, Ohio
65TH YEAR OF BUILDING IDEAS INTO MACHINE TOOLS

SPRINGFIELD

ELECTRIC ARC FURNACES teamed with dependable General Electric transformers provide the most rapid and economical method for the production of increasing quantities of all grades of steels.

INTERNAL WATER-COOLING COILS permit a more compact design using less floor space. Coils are located near the top oil level for maximum cooling effectiveness.



STURDY CORE AND CLAMPING STRUCTURE with circular concentric windings provides maximum strength to withstand repeated heavy current surges.

PAIR-UP your new arc furnace with a reliable G-E Transformer

Specially built for heavy-duty furnace work, with dependable control for all melting processes

You will get the best service from your new arc furnace if it is powered by a G-E arc furnace transformer. Built by General Electric for over 40 years, they are specially braced to absorb the jolting stresses caused by fluctuating heavy currents. High short-circuit strength is assured by the use of G-E pioneered circular concentric windings.

Liberal cooling ducts are provided within the core and the coil stacks. Ample water-cooling coils are mounted inside the transformer near the top oil level where they produce the most efficient cooling and occupy the least amount of space.

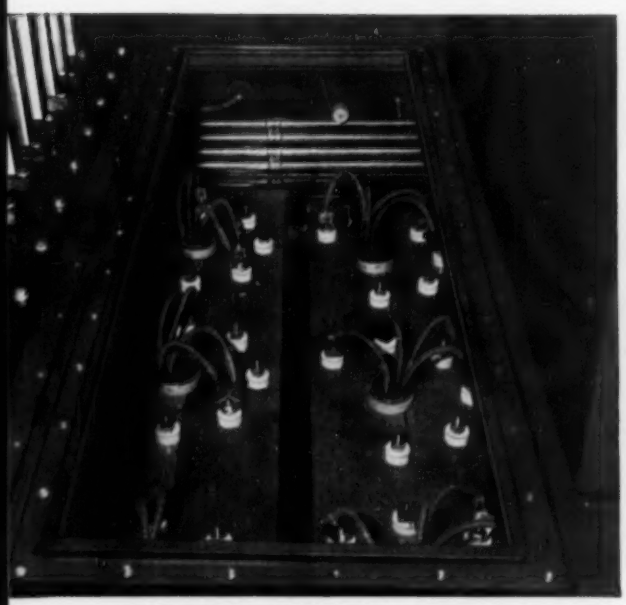
BETTER POWER CONTROL is maintained by the G-E wedge-type tap changing mechanism. It normally requires no maintenance and is both electrically and mechanically interlocked to help safeguard against tap changes when the transformer is energized. A wide selection of secondary voltages and reactance permits the most rapid and efficient operation for each type of melting procedure.

So, the next time you plan the purchase of an arc furnace, specify a General Electric transformer. In fact, for greatest economy and reliability ask for the entire G-E arc furnace electrical package, which includes the famous Magne-blast breaker, Amplidyne electrode control, and Tri-Clad* motors. If you would like to know more about G-E arc furnace transformers, ask your G-E Apparatus Sales Engineer, or write for bulletin GEA-6236 to Section 422-23, General Electric Company, Schenectady 5, N. Y.

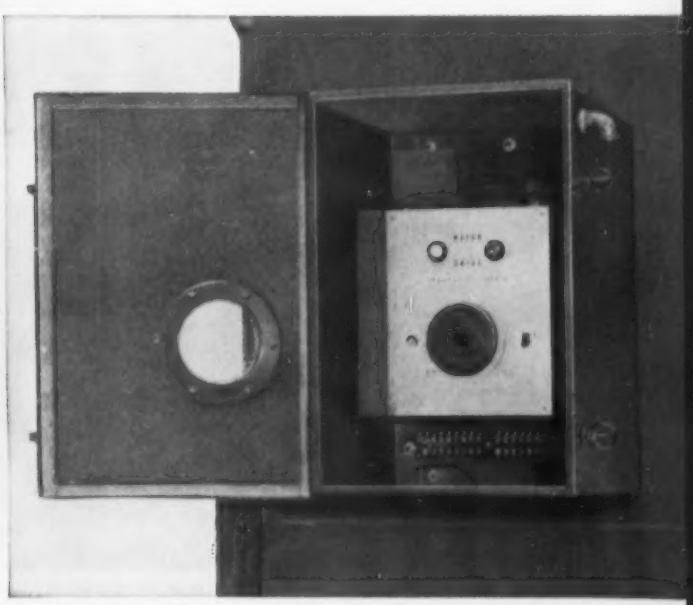
*Reg. trade-mark of General Electric Co.

Progress Is Our Most Important Product

GENERAL ELECTRIC



CONVENIENT TERMINAL BOARD saves time in pre-selecting voltages. Nitrile rubber cover gaskets are completely reusable, requiring no surface preparation or cement.



TAP CHANGER DRIVE is electrically and mechanically interlocked to prevent operation with the transformer energized. Dynamic braking assures exact positioning—requires no adjustments.

AIM for reduced handling

Unitized and strapped sheets of veneer being placed in storage by mechanical lift.

Bulky flue liners are handled easily when unitized into this strapped package.

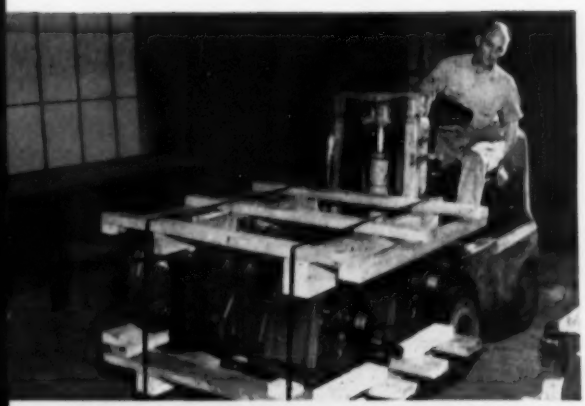
Pressed wood chip logs unitized and strapped in jig for faster handling.

Steel strapping has unitized this package of brick for removal by lift truck.

KD cleated boxes are quickly and easily strapped into units for faster and safer handling.

costs with Acme Steel Strapping

and unitizing ideas



Truck transmissions unitized to cut shipping, material costs and speed handling.

KD cartons unitized on pallet for easy handling and safe shipping.

Unitizing—the process of grouping and strapping individual packages or products into a single unit—is paying off for manufacturers in virtually every industry.

The pictures tell the story of what Acme Steel *unitizing* ideas can accomplish, as brought to industry by your *Acme Idea Man:

. . . Faster handling
. . . Savings in packaging materials
. . . More effective use of warehouse space
. . . Better product protection—safe delivery

Talk to your *Acme Idea Man. Let him show you how to apply Acme Steel Strapping, Strapping Tools and *ideas* to your packing, handling, storage or shipping problems. Just call the nearest Acme Steel office, or use the coupon below.

ask your *Acme Idea Man to help solve your problems

ACME STEEL PRODUCTS DIVISION
ACME STEEL COMPANY
2840 Archer Avenue, Chicago 8, Illinois

ACME STEEL

Get this new UNITIZING BOOK showing industrial unitizing ideas made possible by the use of Acme Steel Strapping. Fill out coupon on the right.

Acme Steel Products Division, Dept. EF-105
ACME STEEL COMPANY
2840 Archer Avenue, Chicago, Illinois

Please send me the new ☐ Acme Steel Unitizing Book. ☐ I am also interested in having an Acme Idea Man call on me.

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

ONE wide-range "OXWELD" W-45 BLOWPIPE handles EVERY welding and heating job

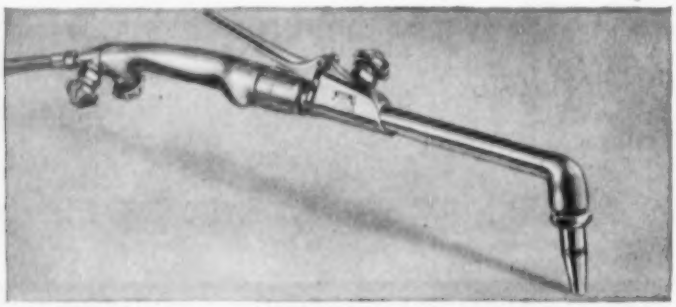
Trade-Mark

*NO OTHER SINGLE BLOWPIPE OFFERS THIS **EXTENSIVE RANGE!***

Anyone whose daily work includes welding and heating will readily appreciate the amazing wide range and versatility of the new OXWELD W-45 Blowpipe. Its 18 head sizes (2 to 300 cu. ft. per hr. capacity) provide a perfect flame for every metal thickness. Light sheet to heavy plate, *one blowpipe does it all!*

From chrome-plated tip to offset hose connections, the W-45 shows the results of over a decade of development work by LINDE engineers. Its exclusive "jiffy-lock" heads, "form-fit" handle, and advanced styling are as modern as guided missiles and atomic power. "O" ring gas seals, flame-stabilizing mixers of improved type, and many other innovations put this blowpipe far ahead of the field in economy, ease of operation, and low-cost maintenance.

See for yourself how you can enjoy tomorrow's operating standards today with an OXWELD W-45 Blowpipe. Ask your LINDE representative for a demonstration, or write for free booklet, F-8684.



CW-45 Cutting Attachment adapts the W-45 Blowpipe for cutting steel up to 8 inches thick.

Linde Air Products Company

A Division of Union Carbide and Carbon Corporation

30 East 42nd Street UCC New York 17, N. Y.

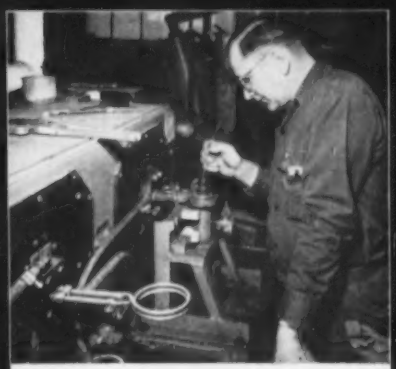
Offices in Other Principal Cities

In Canada: LINDE AIR PRODUCTS COMPANY
Division of Union Carbide Canada Limited, Toronto
(formerly Dominion Oxygen Company)

Linde Trade-Mark

The terms "Linde" and "Oxweld" are registered trade-marks of Union Carbide and Carbon Corporation.

JACK & HEINTZ Saves $15.84 per hour...



Jack & Heintz Inc. silver brazes over 25 different parts on this 15 KW, 10,000 cycle TOCCO machine.

with TOCCO* Induction Brazing

Brazing Costs Down

When Jack & Heintz engineers switched from torch brazing to automatic induction, brazing cost of these inverter brush mounts fell from $.05 to $.006 each —a reduction of 83% in direct labor costs alone! Additional savings result because less cleaning is required after TOCCO, and fuel costs are much lower, too.

Brazing Production Up

While costs dropped, production on the part zoomed —from 40 to 360 brazed assemblies per hour. Furthermore, rejects and scrap, formerly high, are now negligible.

Versatility

The part shown is just one of over 25 parts, large and small, which alert J & H engineers have converted from old-fashioned brazing methods to modern, automatic TOCCO. Overall brazing costs (TOCCO brazing versus former methods used) are down 75%—brazing speed, up 100%.

* * *

If the manufacture of *your* product involves brazing, heat-treating, forging or melting of ferrous or nonferrous metals, don't overlook TOCCO as a sound method of increasing production, improving product quality and slashing costs.

THE OHIO CRANKSHAFT COMPANY

TOCCO

Mail Coupon Today

NEW FREE BULLETIN

THE OHIO CRANKSHAFT CO.
Dept. A-10, Cleveland 5, Ohio

Please send copy of "Typical Results of TOCCO Induction Brazing and Soldering".

Name_____

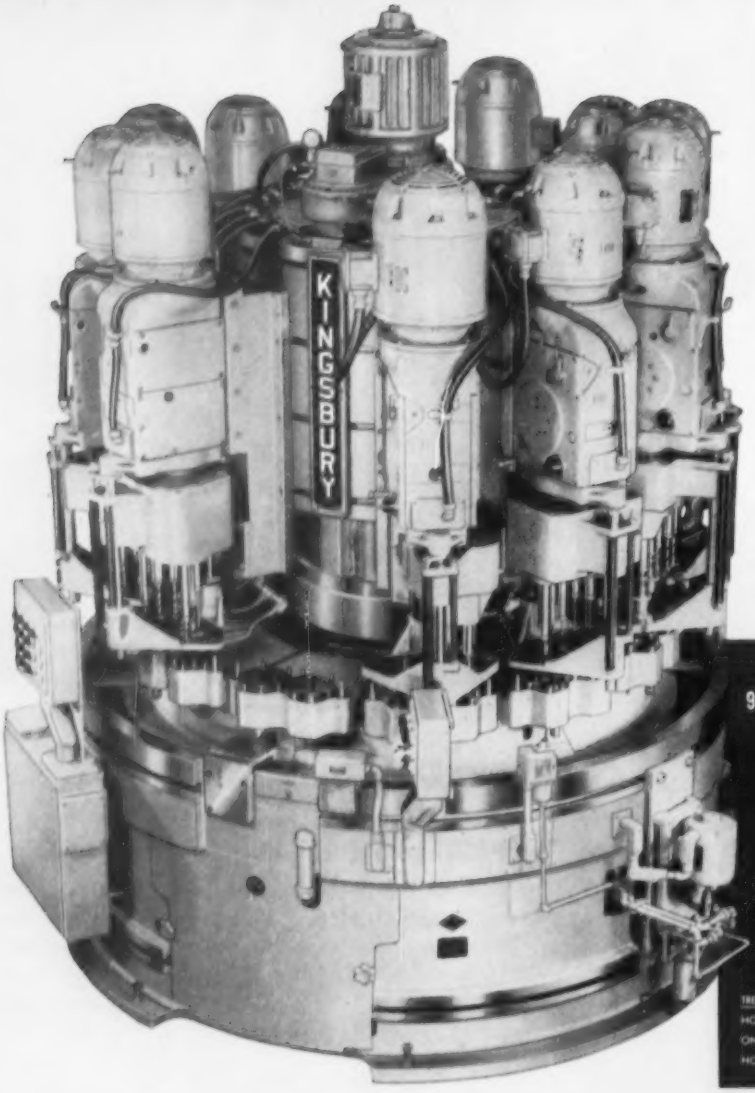
Position_____

Company_____

Address_____

City_____ Zone____ State_____

"Operations Kingsbury" in these two machines



Floor space occupied by each of these Kingsburys has an extremely high production ratio. Here's the story in table form:

Part	Number of Operations	Number of Work Units	Average Sq. Ft. per Unit	Parts per Hour Gross
Valve Plate	91	11	10.0	450
Venturi Cluster	12	12	9.7	600

Steel plate valve featured here measures approximately 5⅜ inches diameter and 5/32 inch thick. It has 23 holes, 10 of which are previously pierced. Print called for seven basic operations as shown in the blueprint and in Table 1 below. Production output is 360 pieces per hour at 80% efficiency. This is an average of one finished piece every 10 seconds. And since there are

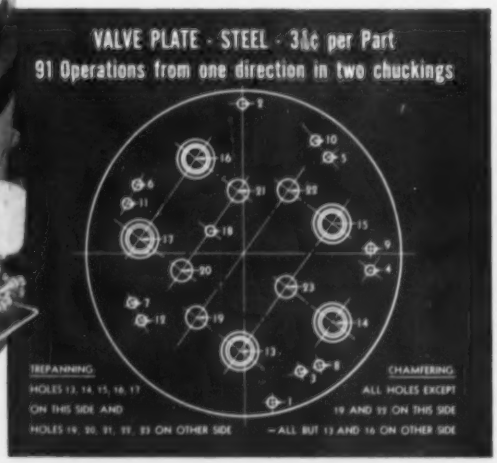

VALVE PLATE - STEEL - 3½c per Part
91 Operations from one direction in two chuckings
TREPANNING
HOLES 12, 14, 15, 16, 17 ON THIS SIDE AND HOLES 19, 20, 21, 22, 23 ON OTHER SIDE
CHAMFERING
ALL HOLES EXCEPT 19 AND 23 ON THIS SIDE — ALL BUT 13 AND 16 ON OTHER SIDE

TABLE 1 — 91 OPERATIONS	HOLES — 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
FIRST CHUCKING, FACE SHOWN	**MACHINE STATION NUMBERS**																						
Drill *10 holes pierced	1	1						4	4	4	4	4	*	*	*	*	*	4	*	*	*	*	*
Chamfer	10	10	3	3	3	3	3	5	5	5	5	5	8	8	8	8	8	10		1	1		1
Tap Drill			2	2	2	2	2																
Ream													6	6	6	6	6						
Trepan													7	7	7	7	7						
Chamfer from rear													9			9							
SECOND CHUCKING, PART TURNED OVER	**MACHINE STATION NUMBER**																						
Chamfer	10	10	2	2	2	2	2	3	3	3	3	3		6	6		6	5	6	8	6	8	8
Tap			11	11	11	11	11																
Ream	1	1						4	4	4	4	4							1	10	10	1	10
Trepan																			5	7	7	5	7
Chamfer from rear																			9			9	
TOTAL OPERATIONS	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	4

develop more production in less floor space

91 operations on each piece . . . well, you figure it!

Kingsbury machine has an 81 inch circular base. All spindles are vertical. Units are mounted on a central column, and are located at the periphery of the 60 inch Index Table. This table indexes through 12 stations, one for loading and unloading.

Each part is run through the machine twice. Twin work-holder fixtures present two parts at each work station, where multiple spindles operate the tools.

* * *

You could palm this die casting and do *magic* with it! In fact, considerable "magic" was evidenced in the die, where straight and tapered holes were formed. Our job was to build an automatic machine to drill and finish holes at angles. That's easy enough! But the customer wanted an average production output of 480 finished pieces per hour — and that's *good* magic!

Production output of 480 pieces is 80% of 600 pieces per hour gross, or one every six seconds! Since each piece requires six basic operations, it was necessary to reduce the time for each operation to the minimum cycle consistent with required accuracy.

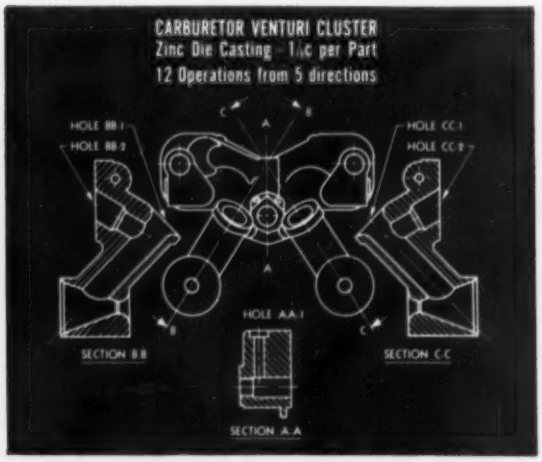
In Table 2 you will note that Holes BB-1 and CC-1 are each drilled in two stages. The burr-reaming operations at two other stations also form the bell-mouths.

Machine has a 96 inch base on which 12 work units are mounted, numbered 2 through 13. Index Table is 30 inches diameter and has 15 work-holding fixtures. Table indexes through 15 stations. Station 15 is for loading and unloading.

* * *

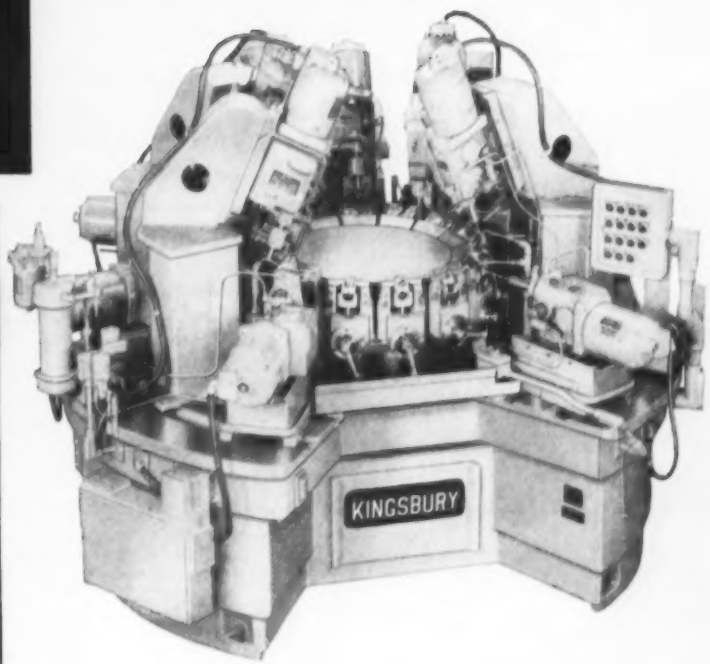
Each Kingsbury is specially designed and custom-built to provide the highest practicable production—at costs which should enable you to write off the capital investment in three years or less. If you have a high production job that's *right* for a Kingsbury, let's get together.

Kingsbury Machine Tool Corp.
112 Laurel Street
Keene, New Hampshire



KINGSBURY
AUTOMATIC DRILLING AND TAPPING MACHINES
for Low-Cost High Production

TABLE 2 BASIC OPERATIONS	Section Holes Numbered				
	AA-1	BB-1	BB-2	CC-1	CC-2
	Machine Station Numbers				
Drill	7-A	2-HR 4-HR	3-AR	9-HL 11-HL	10-AL
Step Drill			3-AR		10-AL
C'bore	8-A				
Burr ream		6-HR		13-HL	
Ream			5-AR		12-AL
Chamfer			3-AR		10-AL
WORK PER HOLE	2	3	4	3	4



ALWAYS FINISHES FIRST

and cuts costs two ways because it's completely automatic!

fast cutting, easy cleaning with

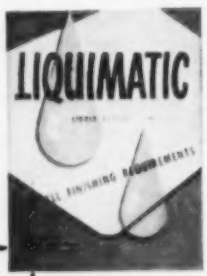
Liquimatic®

the perfect liquid compound for all metal finishing

What are the two big cost factors in your buffing room? Chances are *buff life* figures big when you're talking production costs . . . and the second big factor is *production time* itself. Liquimatic Application Systems are licking these two cost problems in buffing rooms all over the U. S.—because Liquimatic is automatic. An electrically timed system feeds Liquimatic Buffing Compound to the buff in the exact amount to give you the exact cut you need. Because the buff is continually lubricated, buff life is extended up to 400%!

And with Liquimatic there's no compound wasted, no nubbin problem, no hand application, no changing bars—think of the cost savings you can effect in *your* buffing room with these advantages! Savings in buff life alone can soon pay for a complete Liquimatic Application System . . . a system that will continue to save you money—*automatically*.

Check the other features of Liquimatic Buffing Compound . . . then write today for your free copy of Liquimatic's big, new folder that tells the whole cost-saving story of Liquimatic in *your* buffing room.



These additional Liquimatic features mean real savings in terms of time, money, safety—

- longer buff life
- completely automatic
- fast cutting
- easy cleaning
- non-settling
- high flash point
- long storage life
- sprayable viscosity
- adhesive slow-wearing buff face

Liquimatic . . . *gives more buff mileage*

PLATEMANSHIP

Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing—of a complete equipment, process and supply line for every need.

HANSON-VAN WINKLE-MUNNING COMPANY

Main Office and Plant, Matawan, New Jersey

J. C. Miller Division, Office and Plant, Grand Rapids, Mich.

SALES OFFICES: Anderson (Ind.) • Baltimore • Beloit (Wisc.) • Boston Bridgeport • Chicago • Cleveland • Dayton • Detroit • Grand Rapids • Los Angeles • Louisville • Matawan • Milwaukee New York • Philadelphia • Pittsburgh • Plainfield • Rochester St. Louis • San Francisco • Springfield (Mass.) • Utica Wallingford (Conn.)

H-VW-M

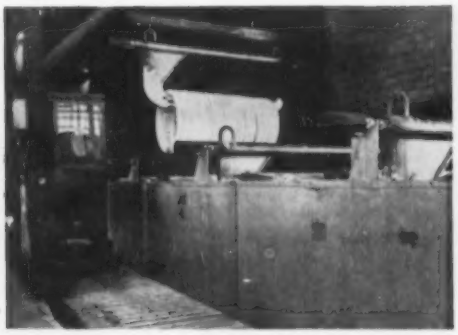
INDUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES

NO PICKLING PROBLEM Too Large or Too Small

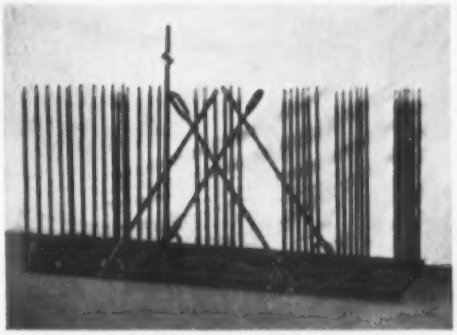
WELDCO Specialists Handle Them All!

IN HUNDREDS OF PLANTS, you'll find Weldco equipment all along the pickling line. For Weldco products are made of corrosion-resisting, hot rolled metals, that withstand attack from hot acids and other pickling solutions. They are strong yet light-weight, wear-resistant, durable, and long-lasting. You get all these advantages when you specify Weldco hooks, mechanical picklers, crates, baskets, racks, chain, steam jets, and accessories.

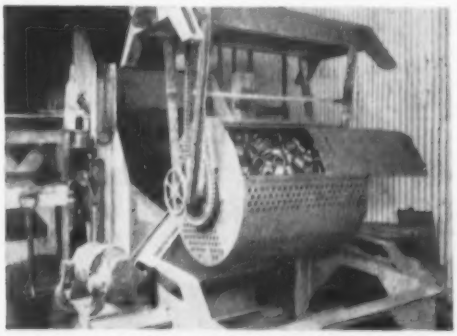
Weldco offers a complete, well-designed line of pickling equipment . . . plus the services of our experienced staff. Let Weldco engineers take care of all your pickling needs. For any problem, large or small, they have the practical, cost-cutting answer.



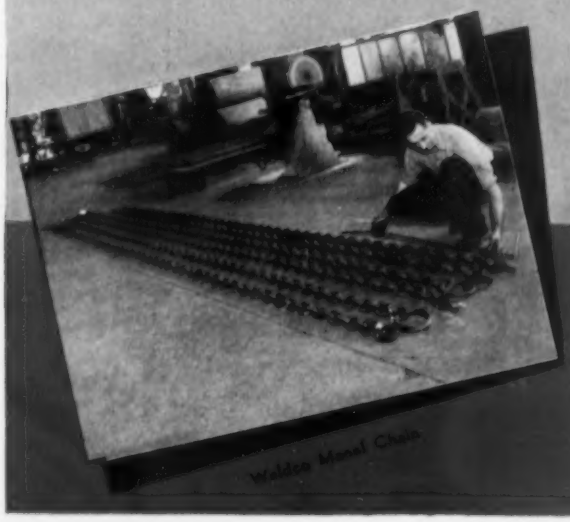
Weldco Pickling Hooks



Weldco Sheet Pickling Crate



Weldco Mechanical Drum Pickler



Weldco Metal Chain

THE YOUNGSTOWN WELDING & ENGINEERING COMPANY

3712 OAKWOOD AVE. • YOUNGSTOWN 9, OHIO

COLLECT IT

AS IT ACCUMULATES — SOLIDS, POWDERS, SLUDGE, LIQUIDS
RAW MATERIALS, FINISHED PRODUCTS, WASTE MATERIALS

Heavy waste is dumped into an open container at a foundry in New York. The first step in the LOAD LUGGER SYSTEM of materials handling is to place a number of containers at strategic points to collect material as it accumulates, reducing handling at the point of origin.

Light material accumulates in an open container with high sides at a shipping carton plant in Louisiana. Rugged LOAD LUGGER containers are built of welded steel, have deep leak-proof bottoms, hold from 1½ to 14 cubic yards and more, and handle all types of material.

It is easy to load this 14-cubic-yard LOAD LUGGER container of a St. Louis contract hauler. It fills to the top without raking and is wind-proof and rat-proof. A model with rubber seals and latches is also theft-proof, fly-proof, dust-proof, and almost odor-proof.

PICK IT UP

ALREADY LOADED — NO LOST TIME AND NO LOADING CREWS
LET ONE TRUCK AND DRIVER DO IT ALL — REPLACING MANY

A full container is picked up at a refinery in Indiana. The second step in the LOAD LUGGER SYSTEM is for one driver and his truck equipped with a hoist-body to pick up full containers on a regular schedule. This procedure does away with lost time and loading crews and eliminates the need for several conventional trucks and their drivers.

A bearing manufacturer in Ohio picks up a full container of dolomite. LOAD LUGGER hoist-bodies (flat-bed truck bodies with a pair of hydraulic-powered hoisting arms) handle pay loads of up to 18,000 pounds and more. They are easily mounted on any truck chassis of suitable capacity, and all controls are installed in the cab.

An open container used for accumulating industrial wastes is picked up by a Chicago contract hauler. For greater safety, LOAD LUGGER hoist-bodies lift containers with four-point suspension and have double-acting hydraulic cylinders for positive control at all times.

LOAD LUGGER®

- **FLAT-BED TRUCK BODIES WITH HYDRAULIC HOISTING ARMS**
- **LEAK-PROOF TILT-DUMP CONTAINERS FOR BULK MATERIALS**

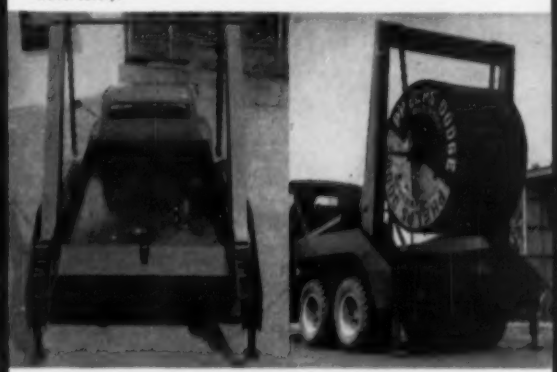
ENGINEERING B-W PRODUCTION

HAUL IT

IN MANY TYPES OF CONTAINERS — OR ON THE TRUCK BED IN PLANT AND OVER THE ROAD — ON YOUR TRUCK CHASSIS

A city truck in Ohio hauls a full container of repair materials. Government approval is evidenced by the many such municipal, state, and federal installations. Hauling full containers is the third step in the LOAD LUGGER SYSTEM, and over-the-road hauls are as feasible as in-plant because of the use of standard truck chassis.

A full container of residue materials is hauled at a corn products processing plant in Illinois. LOAD LUGGER hoist-bodies carry containers well forward for correct load distribution and cradle them between steel sidewalls for greater travel safety.



LOAD LUGGER hoist-bodies also carry materials or equipment directly on their flat beds, loading and unloading heavy objects with their hoisting arms.

This special hoist-body of a Michigan telephone company transports heavy cable reels. Such new uses for LOAD LUGGER equipment are constantly being developed.

DUMP IT

BY TILTING CONTAINER VERTICALLY OVER REAR APRON, OR DELIVER IT BY EXCHANGING FULL CONTAINER FOR AN EMPTY

Spent solvents are dumped into incinerator tank at a drugs and medicines manufacturing plant in Michigan. Delivering full containers or dumping their loads is the fourth step in the LOAD LUGGER SYSTEM. Returning empty containers then completes the cycle.

Metal scrap is dumped and spread in the yards of a scrap metals service company in Iowa. LOAD LUGGER hoist-bodies handle more pay load on a given truck chassis, because they are lighter than comparable equipment. And their patented simplicity, clean design, and sturdy construction make them cost less to buy and maintain.

Equipment of a Miami contract hauler in the dumping position. The LOAD LUGGER hoist-body has outrigger jacks to protect rear springs and axles from injury while picking up and putting down heavily loaded containers, but it neither needs nor uses these jacks while tilting container over rear apron to dump or spread the load.

ENGINEERED, MANUFACTURED, AND MARKETED BY BROOKS EQUIPMENT & MFG. CO., SUBSIDIARY OF

BORG-WARNER

CORPORATION — DISTRIBUTED INTERNATIONALLY

For more information mail this coupon to: **BROOKS EQUIPMENT & MFG. CO. 2065 Davenport Rd., Knoxville, Tenn.**

Name and position

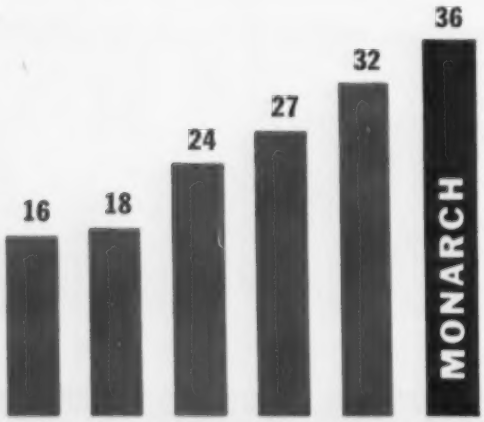
Name of company

Street address

City, zone, state

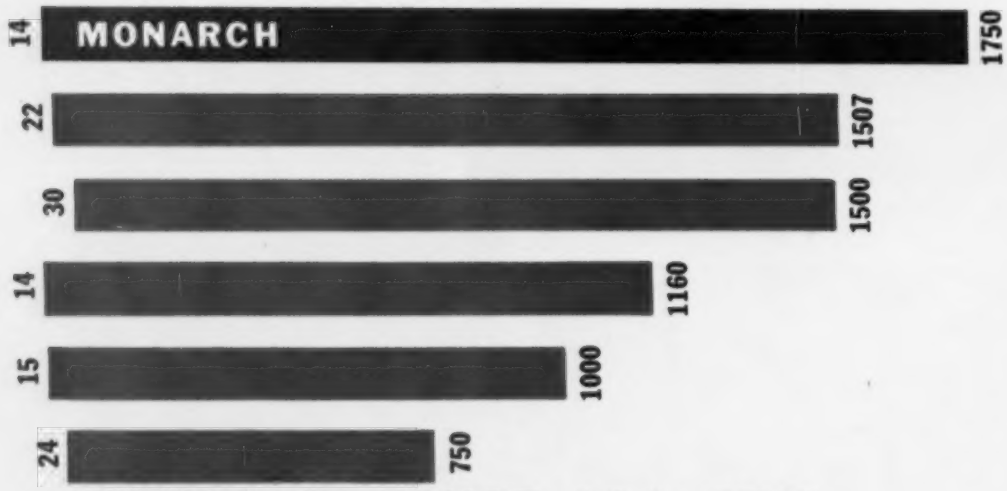
TALK ABOUT SPEEDS!

There's No Matching the Monarch Preselector Dyna-Shift



THE MOST SPEEDS–36

Unique Speed PRESELECTOR DYNA-SHIFT



UNEQUALED RANGE–14 to 1750

Surface Cutting Speed! These three words are the key to top efficiency in the operation of *any* lathe.

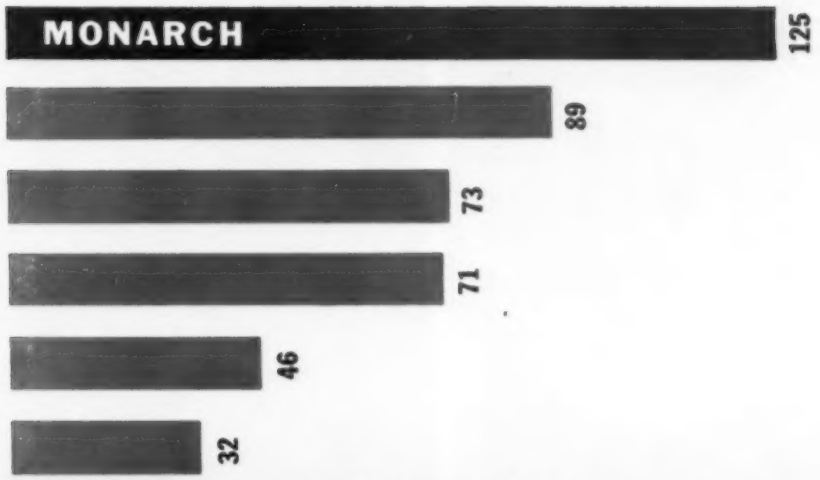
Certainly it's true, you say. But why bring that up? Because only now is a lathe available to give you, practically the correct surface speed, diameter after diameter, piece after piece. That lathe is the new Monarch Series 62 Preselector Dyna-Shift.

It has 36 speeds in a range of 14 to 1750 RPM. Headstock ratio is 125 to 1. And it has *speed preselection.* Here at last is a machine with a standard speed range low enough, high enough and with plenty of speeds in between to make unnecessary a whole assortment of special ranges. With this one standard range you have the power to turn efficiently any part within the work capacity of the lathe.

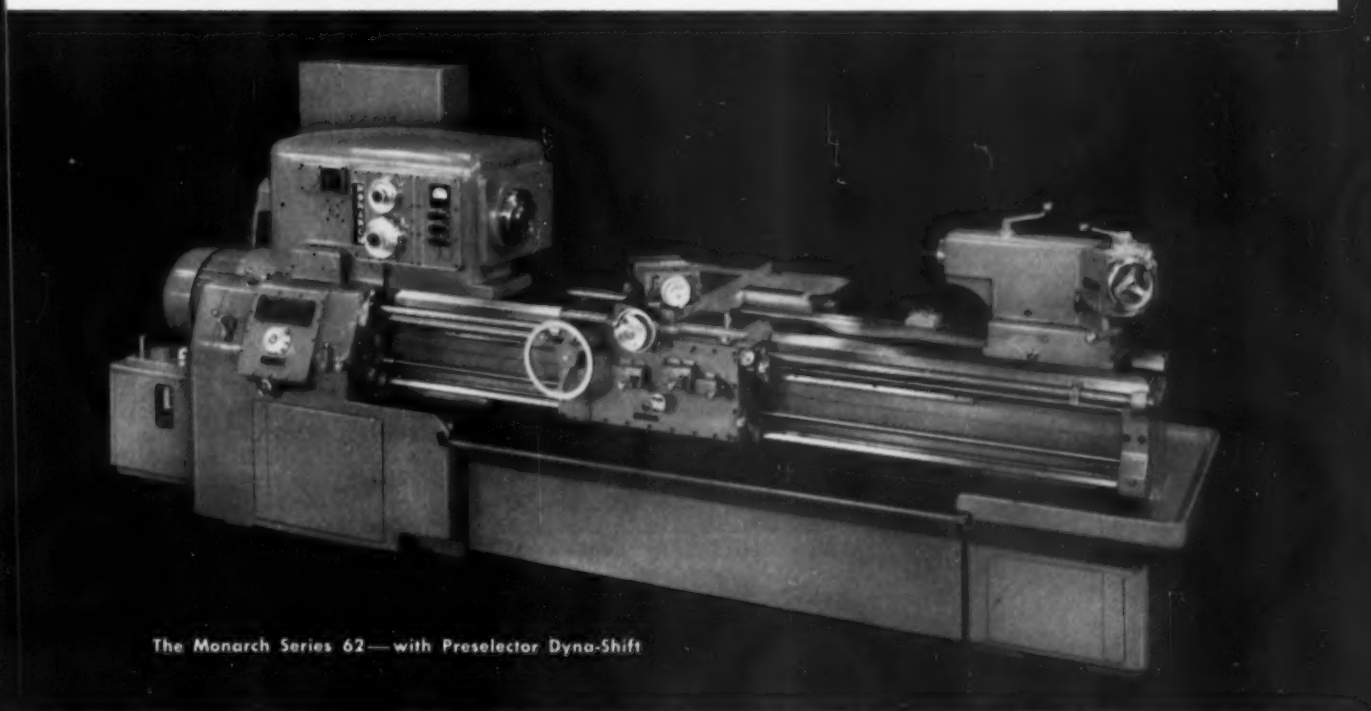
The Dyna-Shift feature makes it unnecessary for the operator ever to figure the R.P.M. he needs for the desired surface speed. He never has to be a calculating machine. He never has to get bleary-eyed figuring a lever setting combination from a complex index plate. He never has to be a color matcher. He never has to set a series of levers in a variety of positions as indicated by the index plate.

All he does is set two large dials on the Preselector Dyna-Shift—one for the work diameter to be turned, the other for the surface speed needed. The machine calculates the necessary R.P.M. and makes the shift automatically. With the preselection feature he may preset up to 6 or more different diameters and set up the shift for each while the machine is turning the previous diameter.

Nowhere but on the Monarch Series 62 Preselector Dyna-Shift can you get this combination. And no other machine can be kept under full load during the entire machining cycle for the utmost in metal removing efficiency. There's an area of cost reduction you cannot afford to overlook any longer. Ask us about it. ***The Monarch Machine Tool Co., Sidney, Ohio.***



GREATEST RATIO—125 to 1



The Monarch Series 62—with Preselector Dyna-Shift

PRODUCTION PLUS

The Monarch Series 62

Increases Productivity up to 25%*
Increases Tool Life up to 50%*

**Figures based on studies comparing step shaft output of Preselector Dyna-Shift with that of a conventional 16-speed headstock lathe.*

Monarch

ACCURACY • ECONOMY • LONG LIFE

TURNING MACHINES

THE MONARCH MACHINE TOOL COMPANY, Sidney, Ohio

Gentlemen:

☐ I am interested in your Series 62 story. Please send me your illustrated Booklet #1505 with complete data.

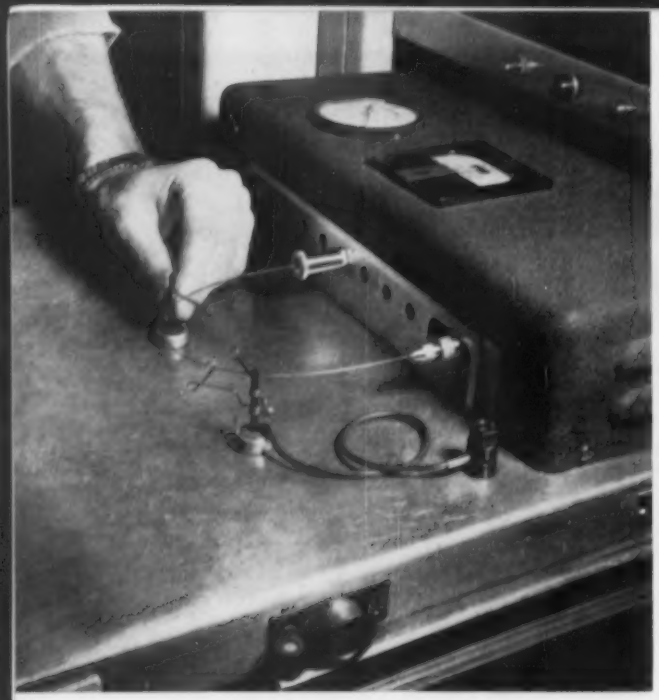
☐ Please have a Monarch sales engineer call on me.

NAME_____ TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____



Design—Johnson music wire, to be used in a volume control spring for your television set, is looped through a 180-degree arc and rotated through millions of cycles on this rotating beam fatigue tester (left). The spring designed from this wire is then vibrated 50,000 times through its operating cycle (right). Test results enable Hunter engineers to select the most economical wire and spring design for the purpose.

Wire Must be Uniform Where . . .

Accurate Measurement of Quality Shaves Costs On Precision Springs

Cost saving through exacting accuracy in design and production of precision springs is a specialty at Hunter Spring Company.

Over the past 25 years, its plant at Lansdale, Pa., has become a thought-center in the industry. Today, this center is becoming increasingly important to spring development for radio and television, electrical and gas appliances, automotive equipment, controls and hundreds of other applications.

To build springs with the precision demanded at Hunter requires assurance of a continuing supply of special wire with consistent and uniform high quality.

For this reason, Hunter produces a large share of its springs from specialty fine wire supplied by Johnson Steel and Wire Company. Take music wire, for example. Starting with sizes as small as .003 inch in diameter (about the thickness of a human hair), so fine that one pound contains over seven miles of wire, Hunter's requirements range upward to diameters as large as .150 inch.

In production of more common springs, Hunter often starts with Johnson's oil tempered M.B. high carbon spring wire in diameters ranging from .030 to .080 inch. It supplements this range with sizes from .080. to .500 inch, produced by experts at Johnson's parent Pittsburgh Steel Company.

As a measure of the importance of uniformity in the wire, consider the unique methods and equipment Hunter uses to design springs.

On rotating beam fatigue testers, developed by Hunter engineers, wire samples of predetermined length are looped through an arc and rotated at high speed. Studies of the number of cycles to failure indicate expected wire life in dynamic service. The life of springs made from this wire is compressed into a period of minutes by vibrating the spring through its entire operating cycle at high speed.

Test results of wire fatigue characteristics are correlated with those for the springs made from it. This enables Hunter to design springs for adequate service at minimum cost. Stress data for a complete range of wire and a wide variety of springs give Hunter research engineers an invaluable basic storehouse of information for economical design of springs. Yet, this information would be practically meaningless without dependable uniformity in the wire they are using.

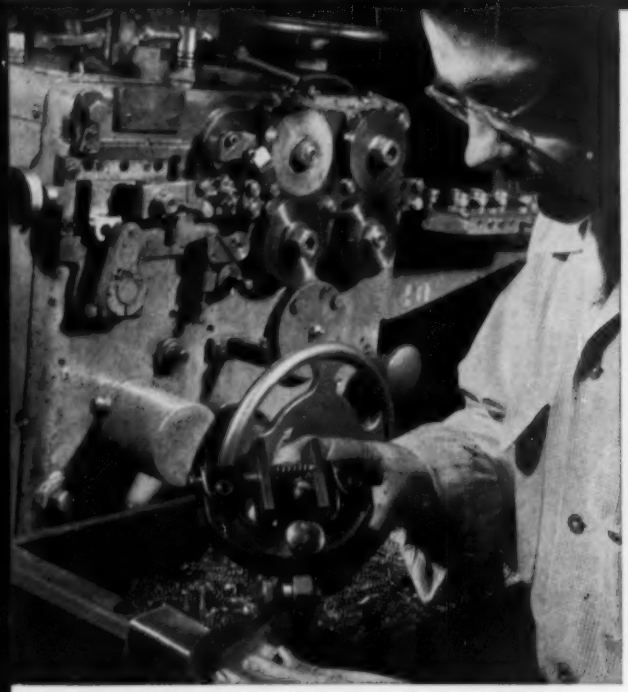
Scientific quality control only begins with spring design, however. It is followed through with thorough inspection during production operations and a unique system for testing finished springs called "statistical quality control."

Hunter production facilities include modern high speed automatic coiling and torsion machines built to turn out precision compression, extension or torsion springs at machine-gun tempo. Special equipment is used to produce springs in a variety of intricate designs.

Secondary operations encompass grinding-of-ends on compression springs, forming-of-ends on tension or torsion springs, heat treating to relieve undesirable residual stresses

TURNING MACHINES

CITY ZONE STATE



Production—Compression springs for high-quality locks made from .040-inch diameter Johnson music wire fly from this standard Torrington W-11 coiler at rates up to 5,000 an hour (left). The new Torrington No. 1 torsion machine equipped with multiple slides (right) is producing intricate refrigerator motor mounting torsion springs from .076-inch diameter music wire at rates up to 7,000 an hour. Each spring is precision built to exceed the life of the motor.

after cold working and plating or coating to resist corrosion—all accomplished on efficient up-to-date operating facilities.

To be scientifically sure that all of these factors, from the testing of wire through the design and production of springs, add up to the exact spring required by the customer, Hunter researchers now go to work again. Equipped with a complete line of testing apparatus for checking loads ranging from a few milligrams to 20,000 pounds, they test each shipment by (1) 100 per cent inspection, or (2) scientific sampling.

Delicate load testing equipment, for example, checks the amount of deflection in each spring. The piece-to-piece variation pattern in each shipment is sent to the customer in the form of a "statistical quality report." This report reduces inspection costs at the receiving end, provides a basis for decisions leading to changes in tolerance specifications, and assures the customer of receiving springs built for maximum performance at lowest cost.

Obviously, the success of this entire system is predicated on consistently uniform quality in wire from coil to coil and from shipment to shipment, even though the shipments may arrive at Hunter many months apart. To supply Hunter, Johnson Steel and Wire Company has geared production and testing techniques to meet these quality standards.

Do you use any of these specialty wires: Aircraft Cord, Armature Binding, Belt Hook, Bobby Pin, Brush, Gutterbroom, Card, Heddle, Shaderoller, Flexible Shaft, Hose Reinforcement, Hose, Mandolin, Piano, Rope, Safety Pin, Special Shaped, Staple, Metal Stitching, Signal Corps, Oil Tempered or MB Hard Drawn, Music Spring, or Tire Bead?

If so, why not take advantage of Johnson's long experience and modernized equipment to fill your requirements with quality wire you can depend on for uniformity? A call to our closest district office today will bring prompt attention!

Testing—Here delicate extension springs made from .009-inch diameter Johnson music wire to be used in record playing machines, are load tested. Under an initial tension of 8.44 grams, each spring is permitted a variation tolerance of only 1.23 grams (the weight of two paper clips). The variation pattern is sent to the customer in a statistical quality report.

Johnson Steel & Wire Company, Inc.

Worcester 1, Massachusetts

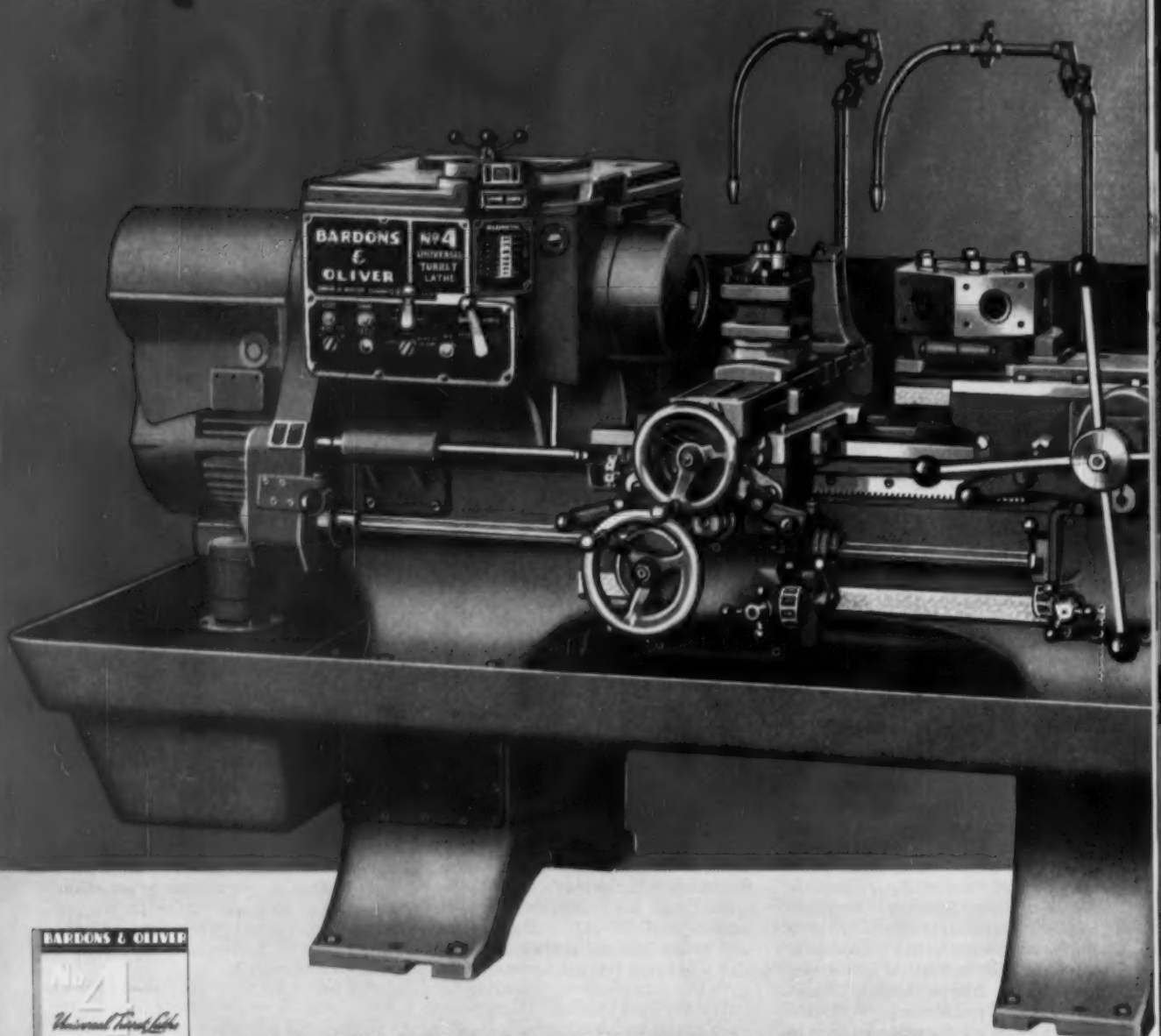
PLANTS: Worcester • Akron • Los Angeles WAREHOUSES: Worcester • Chicago • Los Angeles

a subsidiary of **Pittsburgh Steel Company**

Grant Building • Pittsburgh 30, Pa.

DISTRICT SALES OFFICES: Akron • Atlanta • Chicago • Cleveland • Columbus Dallas • Dayton • Detroit • Houston • Los Angeles • New York • Philadelphia Pittsburgh • San Francisco • Tulsa • Warren, Ohio. PLANTS: Monessen, Pa. • Allenport, Pa. • Akron • Los Angeles • Warren, Ohio • Worcester, Mass.

THE NEW BARDONS & OLIVER No. 4 Universal Turret Lathe...



Write us on your company's letterhead for this new Catalog.

The new No. 4 Universal Turret Lathe incorporates many new features which have sharply increased its productive capacity while lessening the physical effort required of the operator.

A larger selection of spindle speeds, covers a wider overall range. Spindle speeds are instantly preselected and changed. Tool carrying stations have increased rigidity and accuracy. Controls are regrouped for handier and faster manipulation. Wider selection of feeds are provided with positive jaw feed clutches and easier engagement levers.

Power transmitting capacity is adequate to accommodate motors of ample horsepower for the latest developments in cemented carbide tooling.

We welcome the opportunity to quote production estimates on individual requirements.

Features:

- Sixteen Geared Spindle Speeds, providing a fifty to one speed range.
- Three optional spindle speed ranges with maximum up to 2000 R.P.M.
- Constant Horsepower (optional to fifteen) at all spindle speeds.
- Fast operating and effortless Electric Headstock Clutches.
- Fully Automatic Spindle Speed Changing.
- 100% anti-friction bearing headstock and aprons.
- Flanged Type Motor Mounting with reduced overhang.
- Diagonal Cross Ribbing full length of bed and underneath headstock.
- Replaceable Bed Ways of Solid Hardened and Ground Alloy Steel.
- Replaceable Hardened and Ground Steel Turret Slide Saddle Ways, Gibs, and Top Caps.
- Large Hexagon Turret and deep Turret Slide of exceptional accuracy and rigidity.
- Twelve Quick Feed Changes for Cross Slide, Carriage and Hexagon Turret.
- Single Dial Feed Selectors on both Aprons.
- Positive Tooth Feed Clutches with "Easy Action" Engagement Levers.
- Sealed Carriage and Saddle Aprons.
- "One Shot" lubrication of all Tool Slide Ways.
- Accurate and Rigid Square Turret Sealed by Protective Skirt.
- Large Hardened and Ground-in-Thread Ball Bearing Cross Slide Screw.
- Anti-Backlash Adjustable Nut on Cross Slide Screw.
- Built-in Bar Feed Stop providing extra Turret Tool Station.
- Faster Hydraulic Bar Feed and Collet Chuck.
- Only one Bar Feed Setting for a full length of Bar Stock.
- Impeller Type Coolant Pump with Integral Motor Drive.
- Optional Collet Chuck Capacities (2" or 2½" diameters).

MANUFACTURERS OF TURRET LATHES AND CUTTING-OFF LATHES

BARDONS & OLIVER, INC.

1136 WEST 9TH STREET • CLEVELAND 13, OHIO

What are You Looking for

If you are planning to up-grade your product by using a Vacuum Furnace to develop or produce superior metals, here are questions you should ask before buying. Does the Vacuum Furnace have . . .

1 **Hinged door** to conserve floor space . . . assure positive alignment? Provisions for hanging a second door to permit mold set-up work during furnace operation?

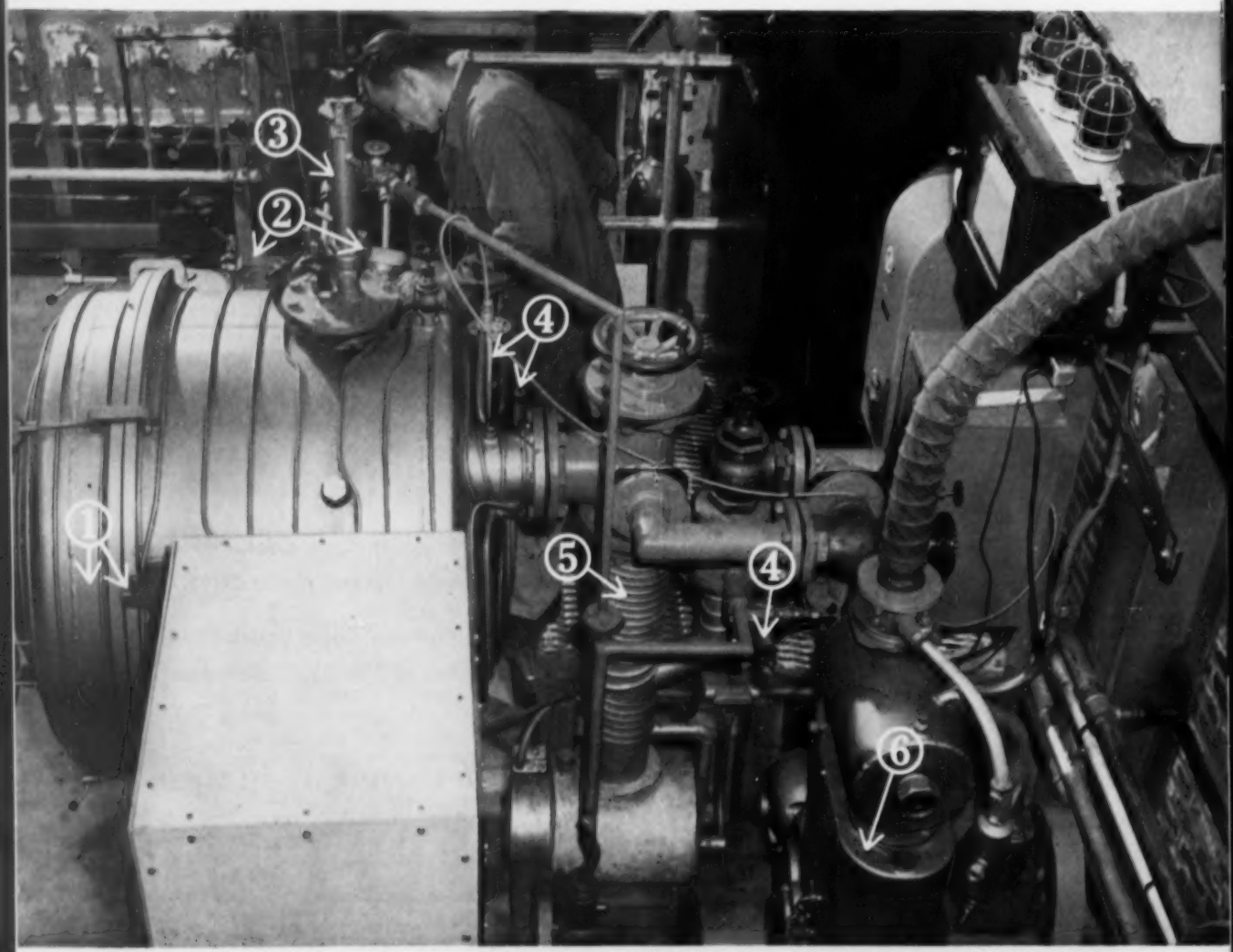
2 **Sight ports** located for ease of operation and equipped with shield and wiper to minimize and remove condensed metallic vapors?

3 **Immersion Thermocouple assembly and air lock** to provide accurate temperature indication for exact process control . . . and to allow retraction and replacement while under vacuum?

4 **Gauging** which resists contamination by condensed vapors from molten bath and provides accurate, reproducible direct reading?

5 High capacity, easy to clean **booster pump** . . . for fast recovery from gas bursts?

6 High capacity **NRC Rotary Gas Ballast Pump** to maintain high efficiency and fast pump down time even on the muggiest days?



First installation for Vacuum Investment Casting. This installation was set up for Austenal Laboratories,

in a Vacuum Furnace?

Vacuum furnaces *can* operate without the features shown below. However, we have learned — from building and operating more high vacuum furnaces than anyone else in the world — that these features more than pay for themselves in terms of safety, flexibility, time, trouble, and money. And these are just some of the special design improvements that NRC engineers can adapt to solve your special problems.

Our years of experience ensure that your NRC Vacuum Furnace will meet your needs as soon as it is installed — and will continue to do so year after year of low cost, trouble-free operation.

Use the coupon below to get your copy of the new NRC Vacuum Furnace catalog *just off the press!*

NRC

NARESCO
EQUIPMENT
CORPORATION

7 **Mold turntable** to permit the "split heat" alloy research technique or the casting of several ingots of varied size and shape from a single heat?

8 Conveniently located **controls** that allow one man to operate the furnace from a central position?

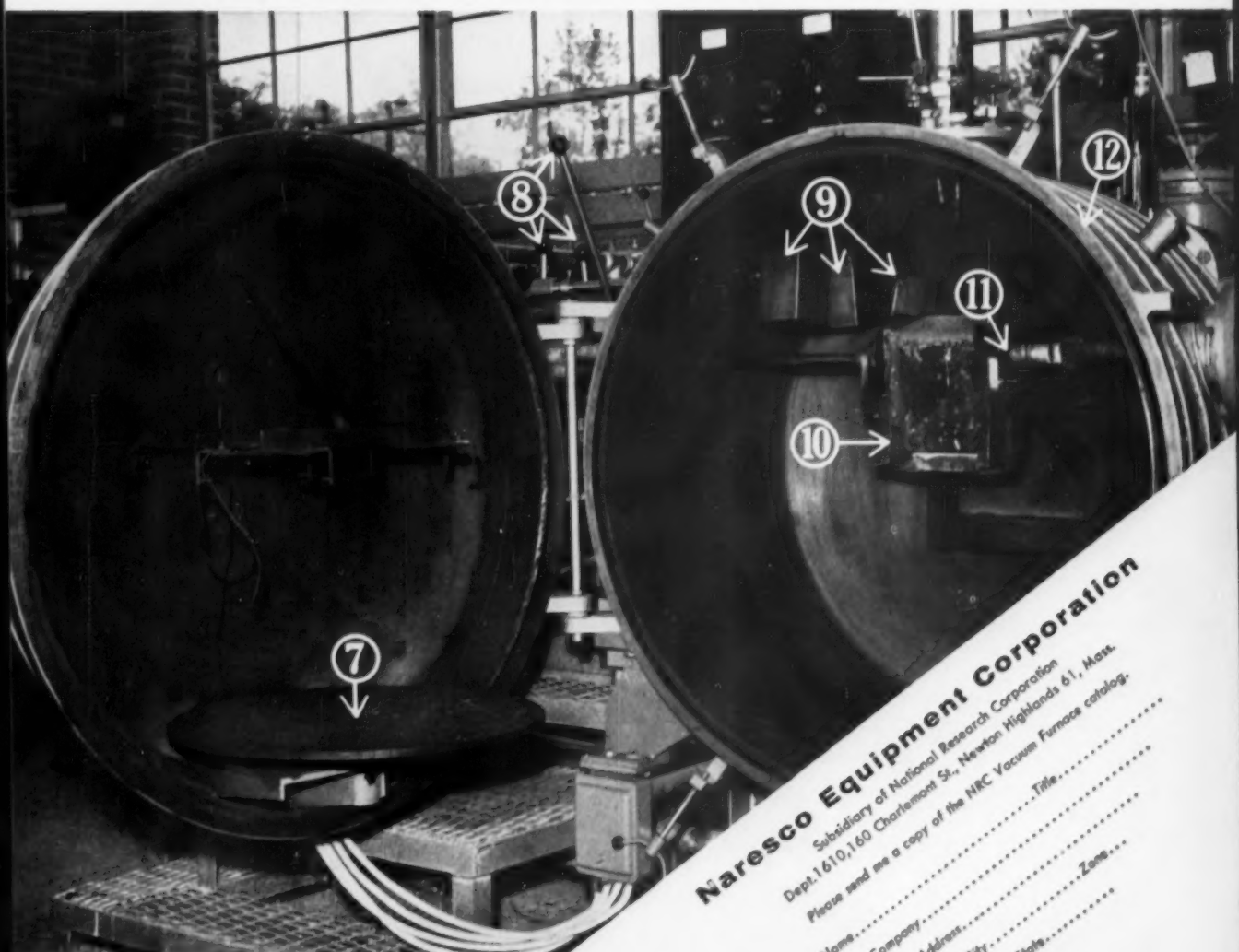
9 **Bulk and alloy charging containers** for using full crucible capacity and to allow late alloying additions for precise control?

10 **Coil** fully insulated electrically to eliminate arcing and resulting dangers of explosions from burn-through?

11 Fast, easy **coil disconnect** from coaxial feed-through to provide rapid, simple crucible change?

12 Large diameter, water cooled, **horizontal stainless steel tank,** for maximum accessibility, flexibility and ease of maintenance?

SEE US AT THE NATIONAL METAL EXPOSITION • PHILADELPHIA, OCT. 17-21 • BOOTH 1577



Microcast Division, Dover, New Jersey, for research and development.

Naresco Equipment Corporation
Subsidiary of National Research Corporation
Dept. 1610, 160 Charlemont St., Newton Highlands 61, Mass.
Please send me a copy of the NRC Vacuum Furnace catalog.

Name.....Title.....
Company.....
Address.....
City.....Zone...
State.....

Bremen Bearings, Inc., uses SUPERLA

Soluble Oil to give bearings the clean, cool treatment

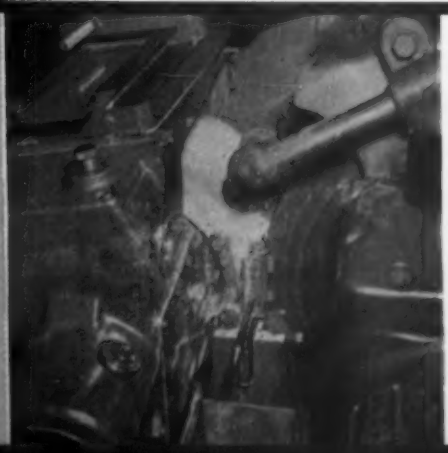
PRECISION NEEDLE BEARINGS are the exclusive product of Bremen Bearings, Inc., Bremen, Indiana. SUPERLA Soluble Oil is used exclusively in all eight of the Company's Cincinnati Centerless Grinders. Plant management experimented with various soluble oils before settling on SUPERLA. They found none could compare with SUPERLA Soluble Oil with respect to wheel loading, stability and tool machine cleanliness.

Plus these benefits, Bremen found SUPERLA mixed readily with water regardless of degree of hardness. The Company found, too, that they got longer tool life and maximum rust protection for work and machines.

You will have the same experience with SUPERLA Soluble Oil. Find out. Inquire of your Standard Oil lubrication specialist. In the Midwest call your nearby Standard Oil office. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

Franklin D. Clark (right), Sales Manager, Bremen Bearings, Inc., and Standard Oil lubrication specialist E. A. Hunt, inspect needle bearing. Gene Hunt is well qualified to assist industrial plants on lubrication problems. In addition to his three years' experience in industrial lubrication sales work, Gene has an M. E. degree from Purdue and has completed the Standard Oil Sales Engineering School. Customers find this experience and training pay off *for them*.

Bearings being ejected from Cincinnati Centerless Grinder at Bremen Bearings, Inc. The Company manufactures needle and spindle bearings to customers' specifications in sizes from 1/16 to ½ inch with tolerances of .0001" and finishes to 3 micro-inches. SUPERLA Soluble Oil is used on all of Company's grinding machines.



STANDARD

STANDARD OIL COMPANY
(Indiana)

ONE OF A SERIES

You Get Many Benefits
by Specifying VICKERS Hydraulics

service
repair parts
replacement equipment

Within Easy Reach of Your Export Customers

Mindful of the fact that capital goods (much of which is Vickers equipped) constitutes 25% of U.S. non-military exports, Vickers is actively building up its export representation. In the panel at the right, are listed the organizations which represent Vickers abroad.

Each of these is equipped to supply engineering information, service, parts, and replacement equipment for the Vickers Hydraulics on the machine tools, industrial machinery and mobile equipment you send abroad. This added convenience is important to your customers . . . hence an important sales factor in your export business.

This is another way in which you get added value when you specify and buy Vickers Hydraulic Equipment.

•

VICKERS INCORPORATED

DIVISION OF SPERRY RAND CORPORATION

1420 OAKMAN BLVD. • DETROIT 32, MICH.

Application Engineering Offices:

ATLANTA (ATwood 0187) • CHICAGO (NEvada 8-0101) CINCINNATI (MAin 1-1756) • CLEVELAND (SUperior 1-4638) • DETROIT (DIamond 1-0990) • HOUSTON (JAckson 2-9623) • LOS ANGELES AREA (El Segundo—ORegon 8-2503) • MINNEAPOLIS (GEneva 5646) • NEW YORK AREA (Summit, N. J.—SUmmit 6-7960) PHILADELPHIA AREA (Media—MEdia 6-5300) PITTSBURGH AREA (Mt. Lebanon—LOcust 1-3504) PORTLAND, OREGON (FIlmore 9446) • ROCHESTER (LOcust 5384) • ROCKFORD (2-0615) • SAN FRANCISCO AREA (Berkeley—AShberry 3-4997) • SEATTLE (SEneca 8171) • ST. LOUIS (PArkview 1-4311) • TULSA (DIamond 3-8655) • WASHINGTON (EXecutive 3-2650) WORCESTER (PLeasant 3-7736—6-5281)

VICKERS Export Representation

AUSTRALIA
Industrial Service Engineers Pty., Ltd.
Ashley Street, Braybrook W. 19
Melbourne, Victoria

•

BELGIUM
Fenwick (S.A.) Belge
68 Quai de Rome
Liege, Belgium

•

CANADA
Vickers-Sperry of Canada Ltd.
156 Evans Avenue
Toronto 14, Ontario

•

DENMARK
Akts. Nordisk Venditor
14, Tordenskjoldsgade
Copenhagen K, Denmark

•

ENGLAND
Stein & Atkinson, Ltd.
Universal House
60 Buckingham Palace Rd.
London, S.W.1, England

•

FINLAND
Ins. tsto. H. Auramo
Fabianinkatu 13
Helsinki, Finland

•

FRANCE
Fenwick S.A.
8 Rue de Rocroy
Paris 10e France

HAWAII
Hawaiian Equipment Co.
2880 Kilihau Street
P. O. Box 2990
Honolulu 2, Hawaii

•

ITALY
Societa Fenwick
Viale Vittorio Veneto, 16
Milan, Italy

•

JAPAN
Tokyo Keiki Seizosho Co., Ltd.
31, 4 Chome, Higashi-Kamata
Ōta-Ku, Tokyo, Japan

•

NORWAY
Venditor A/S
Post Office Box 127
Ski, Norway

•

SOUTH AFRICA
Hydraulics (S.A.) Ltd.
P. O. Box 111
Faarden Eiland
Capetown C.P., So. Africa

•

SPAIN
S.A.M. Fenwick
Bruch 96
Barcelona, Spain

•

SWEDEN
AB Specialpumpar
Goteborg, Sweden

7302

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

The Results of this Important Research Project are basic to every man who faces a Rust Problem

RUST-OLEUM®
A CORPORATION
STOPS RUST!

CHICAGO · BRIDGEPORT · NEW ORLEANS · OAKLAND · LOS ANGELES
EVANSTON · ILLINOIS

PLANT LOCATIONS

September 15, 1956

SUBJECT: Special Report to Industry

It is generally recognized by engineers and corrosion experts that there is far more to stopping rust on a rusted surface, than just applying any type of material at a certain film thickness. Dry film thickness of a protective coating is important--but, it's what goes on UNDER the film surface that counts, too. The vehicle of the coating that's applied over rust must penetrate to bare metal, driving out the air and moisture that, in presence of metal, cause rust.

Rust-Oleum users, for over thirty years, have known that Rust-Oleum does exactly that through practical use and results of the application of the product. However, Rust-Oleum wanted to go even further in bringing you irrefutable proof of this penetration.

With this in mind, the Rust-Oleum Corporation consulted with technologists from the Battelle Memorial Institute in Columbus, Ohio, who conducted this important research project, utilizing radioactive tracing technique with C14 radioisotope to measure Rust-Oleum penetration. Now, after nearly three years of continued research, you can actually look UNDER the surface film and see how the Rust-Oleum penetrates rust to bare metal.

The methods and results of this research, which are outlined on the following pages, are given in their entirety in a thirty-page report entitled, "The Development of a Method to Determine The Degree of Penetration of a Rust-Oleum Fish-Oil-Based Coating Into Rust Coatings on Steel Specimens," prepared by Battelle Memorial Institute technologists. It is available to you without cost or obligation by request on your business letterhead.

Very truly yours,

RUST-OLEUM

Robert A

President

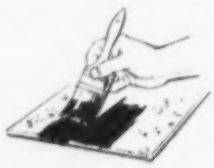
RAF/jc

Now! For the first time, actually look *under* the surface of the coating! See Rust-Oleum *penetrate rust* to bare metal through the "eyes" of radioactivity!

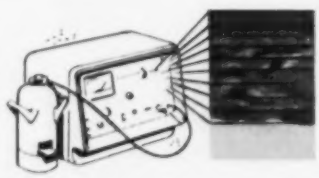
(A RUST-OLEUM REPORT TO EVERY PERSON FACED WITH A RUST PROBLEM)

Nearly three years of research, utilizing radioactive tracing with C^{14} radioisotope, enables you to follow Rust-Oleum penetration through the heretofore "unseen" rust area to bare metal. While Rust-Oleum users, for over thirty years, have known that Rust-Oleum penetrates rust to bare metal when applied over rusted surfaces—Rust-Oleum wanted to go even further in bringing irrefutable evidence of this penetration to you. The methods and results, on which the technical information on these pages is largely based, are presented in a complete thirty page report entitled, "The Development of a Method to Determine The Degree of Penetration of a Rust-Oleum Fish-Oil-Based Coating Into Rust Coatings on Steel Specimens," prepared by Battelle Memorial Institute technologists. Request your copy on your business letterhead without cost or obligation.

1 To trace Rust-Oleum penetration through rust, the Rust-Oleum fish oil vehicle was made radioactive with C^{14} radioisotope. The radioactive Rust-Oleum fish oil vehicle was then formulated into Rust-Oleum 769 Damp-Proof Red Primer without changing Rust-Oleum's exclusive formulation or performance of product.



2 Rusted metal test panels were scraped and wirebrushed to remove rust scale and loose rust, according to Rust-Oleum's standard directions for application. The radioactive Rust-Oleum 769 Damp-Proof Red Primer was then brushed on directly over the remaining rust on these rusted test panels and allowed to dry.



3 Then—the surfaces of the rusted panels were shaved at approximate half-mil levels and Geiger Counter readings of Rust-Oleum penetration (radioactivity) were taken at each level down to bare metal. These measurements are shown as "Percentage of Surface Radioactivity" figures on the graph on the opposite page.

Dry film thickness of a coating is important, but, what goes on UNDER the film surface is vitally important, too, in the stopping of rust. Rust-Oleum Stops Rust, because it penetrates the rust to bare metal. The Rust-Oleum fish oil vehicle works around the rust particles and through the fissures and crevices in the rust formation to the bare metal. It doesn't "bridge-over" the tiny, microscopic pits in the metal—BUT, actually goes into these pits to drive out air and moisture and coat the metal with a penetrating, low-surface-tension film that expands and contracts with the metal. Because of this unusual penetration, you can apply Rust-Oleum 769 Damp-Proof Red Primer directly over the rusted surface after scraping and wirebrushing to remove rust scale and loose rust. Thus—you save time, labor, and money as costly surface preparations are usually eliminated.

From tanks, girders, machinery, roofs, sash, stacks, pipes, wire fences, and building maintenance in industry . . . marine, farm, or railroad applications . . . to gutters, metal sash, lawn furniture, etc. around the home . . . Rust-Oleum is the modern way to Stop Rust and beautify as you protect, in your choice of Red, White, Black, Aluminum, Gray, Green, Yellow, Blue, etc. May be applied by brush or spray and dries to a firm, *decorative* coating that resists salt water, salt air, heat, fumes, sun, humidity, and weathering. Industrial users see Sweets for complete catalog and nearest Rust-Oleum Distributor, or attach coupon on the opposite page to your business letterhead for complete information, including your thirty-page report on Rust-Oleum penetration. Homeowners will find Rust-Oleum featured at leading Hardware, Paint, and Lumber dealers in most localities.

there is only one Rust-Oleum . . . *it is distinctive as your own fingerprint*

RUST-OLEUM®

Rust-Oleum is exclusive. It incorporates a specially-processed fish oil vehicle that penetrates through rust to bare metal. It dries right and is free of objectionable odor. Many attractive colors.

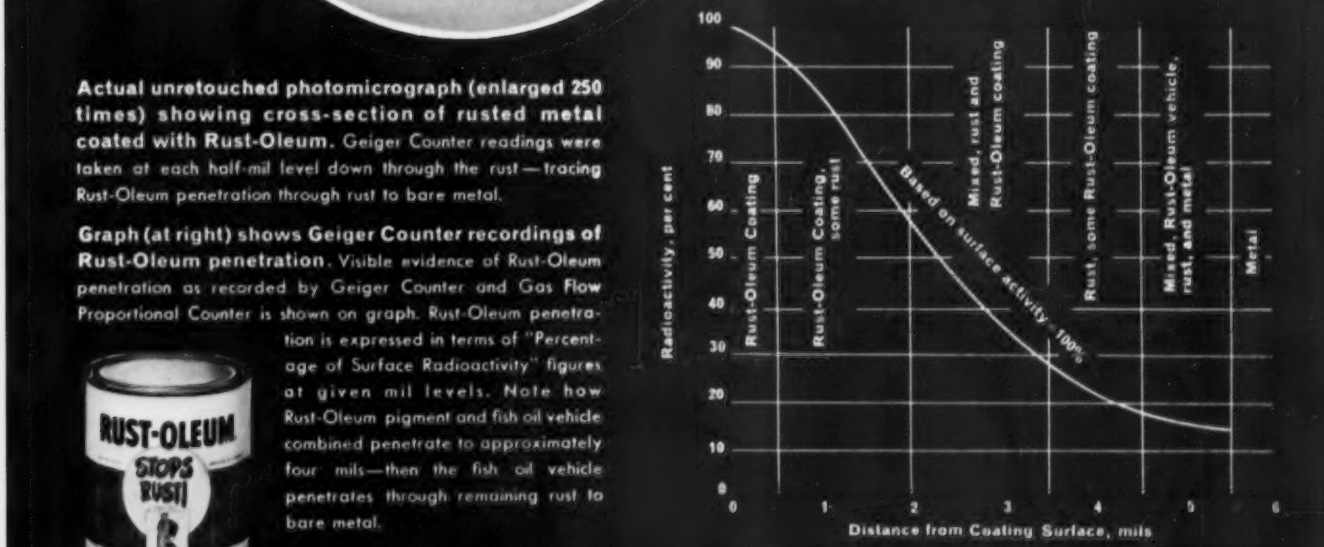
STOPS RUST!

A new Rust-Oleum development is the Rust-Oleum Galvinoleum coating. It sticks to new or old galvanized surfaces *without* etching, *without* weathering. Available in red, gray, green, metallic.

Photomicrograph (enlarged 250 times) of cross-section of rusted metal coated with Rust-Oleum.

Actual unretouched photomicrograph (enlarged 250 times) showing cross-section of rusted metal coated with Rust-Oleum. Geiger Counter readings were taken at each half-mil level down through the rust—tracing Rust-Oleum penetration through rust to bare metal.

Graph (at right) shows Geiger Counter recordings of Rust-Oleum penetration. Visible evidence of Rust-Oleum penetration as recorded by Geiger Counter and Gas Flow Proportional Counter is shown on graph. Rust-Oleum penetration is expressed in terms of "Percentage of Surface Radioactivity" figures at given mil levels. Note how Rust-Oleum pigment and fish oil vehicle combined penetrate to approximately four mils—then the fish oil vehicle penetrates through remaining rust to bare metal.



GET THE COMPLETE STORY. ATTACH TO YOUR BUSINESS LETTERHEAD FOR YOUR COPY OF THIS THIRTY-PAGE REPORT WITHOUT COST OR OBLIGATION.

Rust-Oleum Corporation
2980 Oakton Street, Evanston, Illinois

- ☐ Please send me without cost or obligation, the Rust-Oleum thirty-page report entitled, "The Development of a Method To Determine The Degree of Penetration of a Rust-Oleum Fish-Oil-Based Coating Into Rust Coatings On Steel Specimens," as prepared by Battelle Memorial Institute technologists.
- ☐ Complete literature and color charts.
- ☐ Nearest source of supply.

...there is only one Rust-Oleum...it is distinctive as your own fingerprint

RUST-OLEUM IS EXCLUSIVE. Most manufacturers of protective materials specify that rusted metal surfaces must be free of rust before applying their product. Rust-Oleum does NOT! With Rust-Oleum you simply scrape and wirebrush to remove rust scale and loose rust —then brush Rust-Oleum 769 Damp-Proof Red Primer directly over the remaining rust. The specially-processed fish oil vehicle penetrates rust to bare metal, merging the rust particles into the coating. It dries to a firm, decorative coating that resists salt water, salt air, heat, fumes, humidity, sun, moisture, and weathering. This unusual penetration saves you time, labor, money, and metal because sandblasting, chemical pre-cleaning, and other costly surface preparations are usually eliminated.

AVAILABLE IN *MANY COLORS.* You beautify as you protect because Rust-Oleum is available in many, many attractive colors including Aluminum, White, Black, Green, Red, Gray, Orange, Yellow, Blue, etc. In addition to industrial rust preventive coatings, Rust-Oleum finish coatings, incorporating the same specially-processed fish oil vehicle, are available (1) to match original equipment manufacturer's colors for farm and road and highway construction equipment, (2) Oil Field finishes to match original equipment colors for rigs, pumps, etc., (3) Restful Colors for plant and institutional interiors, (4) Special Marine and Railroad finishes, (5) Heat Resistant and Chemical Resistant finishes, (6) Masonry and Floor Coatings.

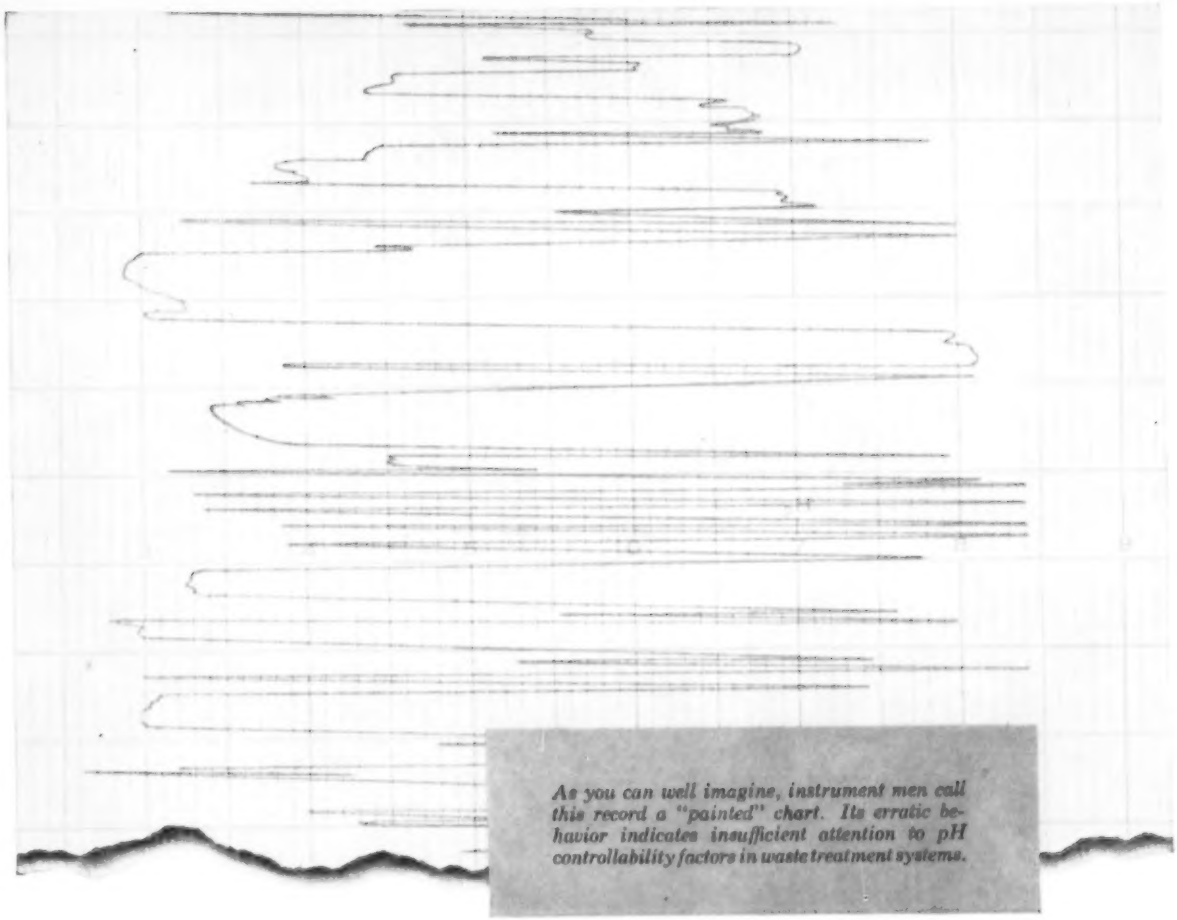
RUST-OLEUM®

Remember—Rust-Oleum's unusual rust-resistant qualities enable you to apply Rust-Oleum 769 Damp-Proof Red Primer one season—and wait until the following season to use your Rust-Oleum finish coating. Thus—you "stretch" maintenance budgets season-to-season.

STOPS RUST!

Write on your business letterhead for your copy of the special Rust-Oleum thirty-page report, entitled, "The Development of a Method to Determine The Degree of Penetration of a Rust-Oleum Fish-Oil-Based Coating Into Rust Coatings on Steel Specimens." We'll be glad to send it to you promptly, and there is no cost or obligation.

Rust-Oleum Corporation · 2980 Oakton Street · Evanston, Illinois



As you can well imagine, instrument men call this record a "painted" chart. Its erratic behavior indicates insufficient attention to pH controllability factors in waste treatment systems.

FOR EFFICIENT WASTE TREATMENT

don't "paint" the chart!

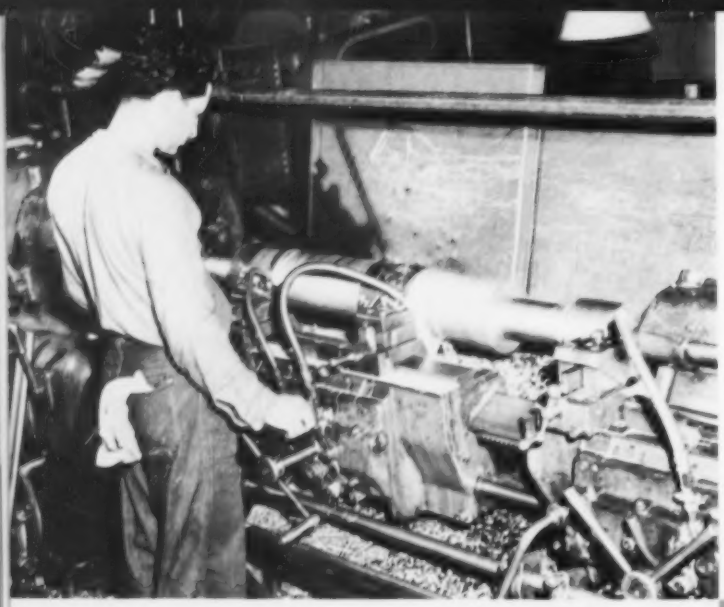
In Any Given Waste Treatment System, the factors governing pH controllability—type of waste, variations in flow and concentration, layout and retention of the system, etc.—determine operational success. A painted chart may indicate that a system has been designed and instrumented without due regard to these factors, a regard which only L&N's pH Controllability Analysis provides.

This unique Analysis gives us vital information about the controllability factors of individual waste treatment processes. Our engineers analyze these data to determine the limits within which the process can be controlled in a proposed treating system, or to recommend the physical layout needed to gain the desired degree of control—the answers you need to achieve efficiency in industrial waste treatment.

Process Data Sheet 700(2), "L&N Speedomax Control of Plant Waste Disposal Processes", outlines this approach to industrial waste treatment. Write for a copy and you'll also receive a Controllability Analysis Questionnaire to fill out and return, without obligation, for concrete answers to your specific waste treatment problem. The address—4956 Stenton Ave., Phila. 44, Pa.

LEEDS LN **NORTHRUP**

instruments · automatic controls · furnaces



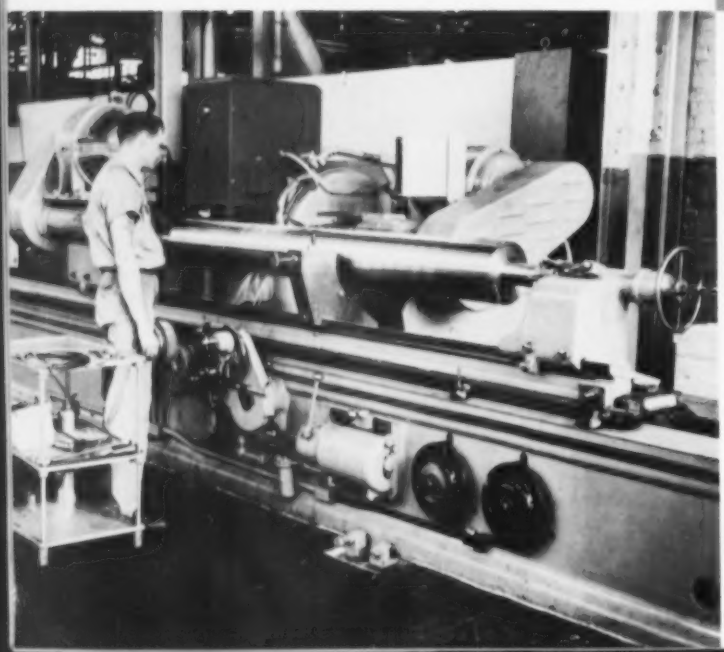
CONTROLLED RIGHT

from START to FINISH

QUALITY CONTROL OF McKAY ROLLS begins at the steel mill, where analysis is carefully checked and a recorded microscopic examination of each heat is made to insure a prior structure which will have a uniform response to heat treatment.

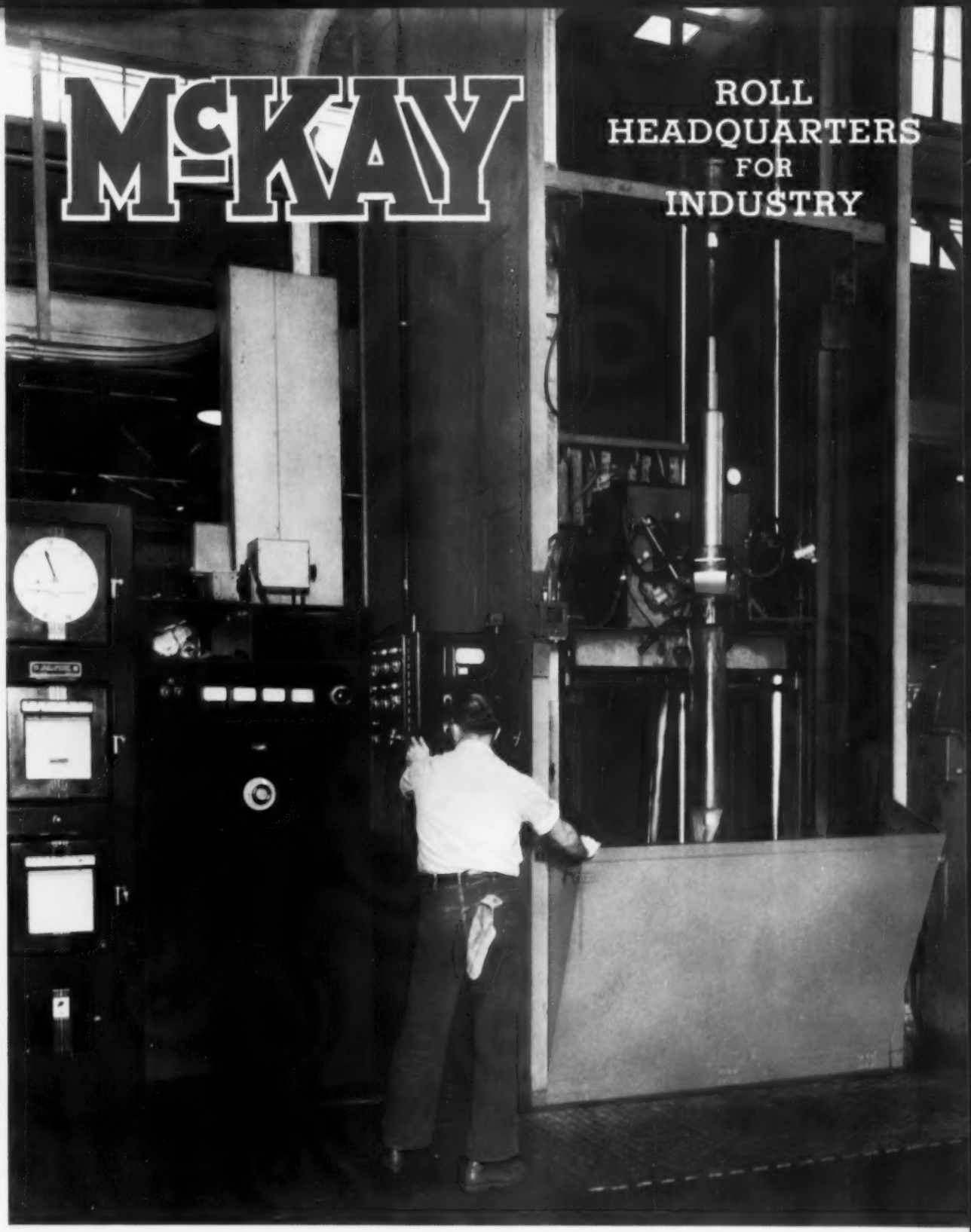
The mill rolled bar is rough turned, annealed for strain relieving and subjected to an ultrasonic inspection to guarantee soundness.

McKAY'S NEW INDUCTION HEAT TREATING EQUIPMENT (illustrated on opposite page) is a guarantee of uniform hardness at maximum depth. Rolls hardened by this method result in minimum distortion and require a minimum grinding allowance thereby increasing roll life because more of the hardened case is retained.



EVERY McKAY ROLL is ground to close micrometer tolerance and must pass a ROCKWELL and SUPERSONIC inspection. You can expect more production from McKAY ROLLS.

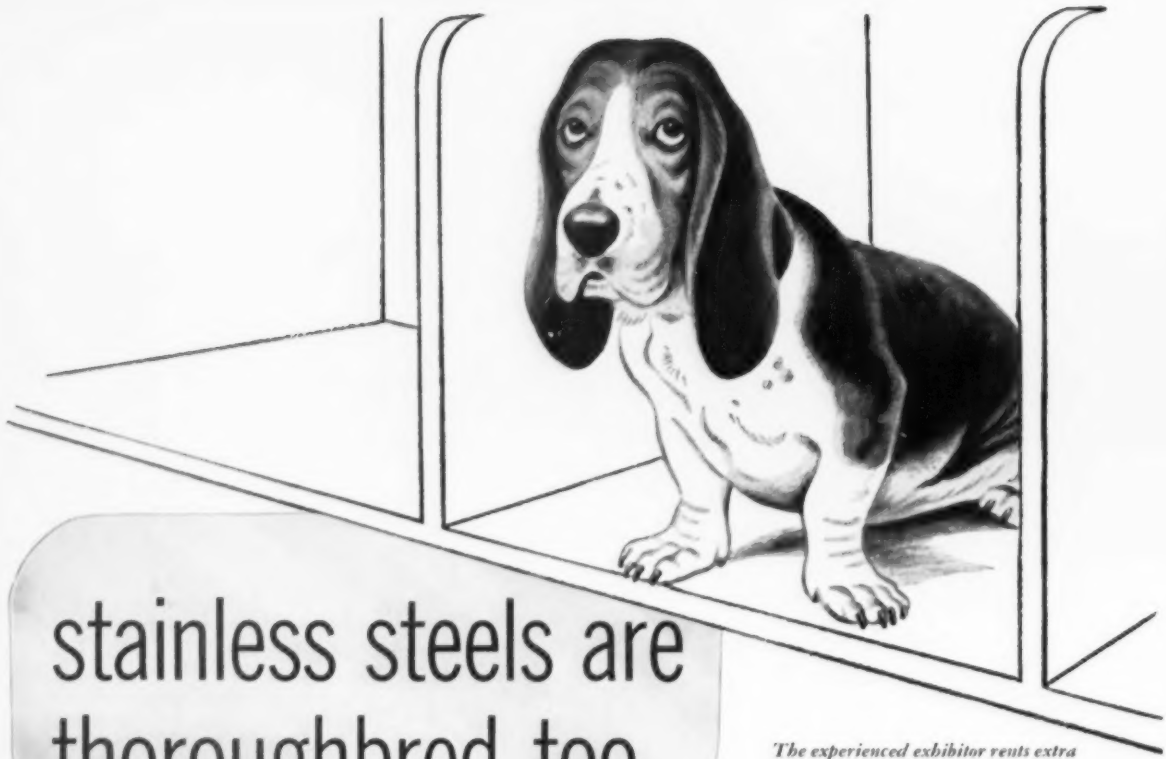
We would appreciate the opportunity to add you to our list of satisfied customers. Let us quote on your next roll requirements.



The **McKAY MACHINE** *Company*

YOUNGSTOWN, OHIO

DESIGNERS AND MANUFACTURERS OF EQUIPMENT FOR THE AUTOMOTIVE, FABRICATING AND STEEL INDUSTRIES



stainless steels are thoroughbred, too

The experienced exhibitor rents extra stalls... leaves them empty... to prevent contamination of his thoroughbred pets by canine neighbors.

To develop their best qualities demands *exclusive* care. That is why Sun Ship's new Alloy Products Shop has been planned for the *exclusive* fabrication of stainless and alloy steel products. When you have selected from the many available Alloys a stainless steel best suited for your service condition, you have done only half the job. You must also provide for the best possible fabrication if you are to have full protection—"A Thoroughbred Job."

Why entrust stainless steel to be fabricated in the same shop where carbon steel products are fabricated, and subject this precious metal to contamination with iron fragments, dust, or other harmful elements? A segregated shop is your answer.

Sun Ship now operates an all-alloy shop, one especially built and equipped for fabricating stainless and alloy products as they should be—segregated from carbon steel fabrication.

We emphasize the fabrication of medium and heavy stainless, alloy and aluminum products for industry.

Try Sun Ship for stainless fabrication as it should be done.

Our Sales Engineering Department will be pleased to assist you with any of your fabrication problems.

Sun Ship also makes all types of carbon steel pressure vessels.

ALLOY PRODUCTS SHOP

OF Sun SHIPBUILDING & DRY DOCK COMPANY

ON THE DELAWARE • **CHESTER, PA.** • 25 BROADWAY, NEW YORK CITY

NEW

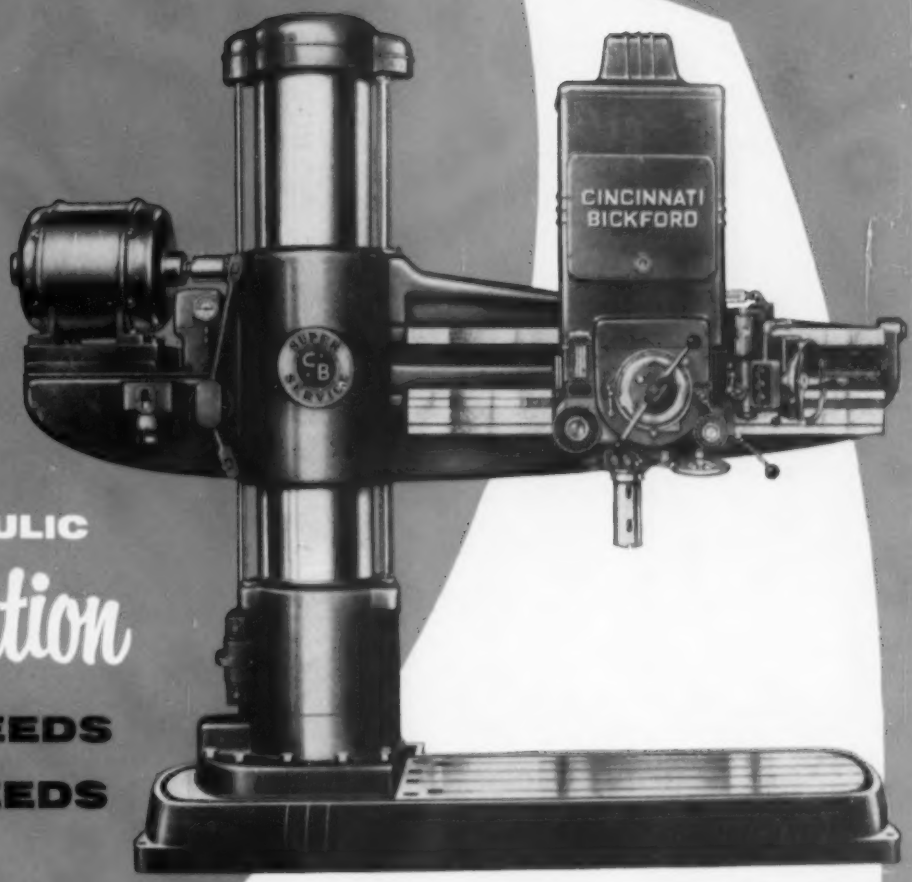
100%

HYDRAULIC

preselection

of 36 SPEEDS

and 18 FEEDS



plus ....SIMPLE PRESCHEDULING

Pre-selection of all speeds and feeds is a new development in radial drill design that saves time and effort. At any time, merely turn 2 convenient direct-reading dials to the proper speed and feed for the next operation. Gears shift hydraulically—quietly and quickly.

Pre-scheduling of radial drill operations is conveniently and simply done without expensive, complicated programming attachments on Super Service Radials. These features will cut drilling costs.

◀ Get all the facts by writing for Booklet R-33.

CINCINNATI BICKFORD

RADIAL AND UPRIGHT DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO.

Cincinnati 9, Ohio, U.S.A.

NEW DAY COMING FOR WEIGHT-SAVERS!

For example . . . you can reduce the weight of a part as much as 44% with Republic Titanium, yet not sacrifice a single pound of tensile strength.

Or . . . if you require additional strength, use Republic Titanium to gain it without adding weight to the part.

You've probably thought of Titanium as "one of those rare metals only the aircraft industry can get . . . or afford." And that has been the case, in the past.

But Republic Steel and other producers of Titanium are steadily increasing their facilities, as well as improving their processes and products, looking toward the time when there should be Titanium for almost everybody. You'll be foresighted to learn now what Republic Titanium Alloys can do for your product, and you, tomorrow or a year from now . . . or perhaps as long as five years hence.

Republic Steel is an old hand at this high strength-to-weight business. For a quarter century we've been helping customers design and engineer strong steel alloys and stainless steel into parts that need more strength without extra "beef", or extra rigidity without excess pounds. That's why Republic can offer you unbiased recommendations on any metal problem. Where Republic Titanium will be best, we'll say so . . . where a Republic Alloy Steel or Stainless Steel will do the job better, that's our suggestion.

The coupon below will bring literature to give you a head start on Republic Titanium over competitors. Mail it today.

THE CINCINNATI MILLING MACHINE CO.
Cincinnati 9, Ohio, U.S.A.

REPUBLIC STEEL

...ready with the answers to your strength-to-weight problems...

One man's problem may call for alloy steel . . . another's a stainless steel . . . and a third's a special carbon steel . . . all made by Republic. At Republic, we roll more types of steels and make more types of steel products than any other producer. From decades of experience with many problems and many fabrication processes, the Republic Technical Man can hand you the answer that meets your needs.

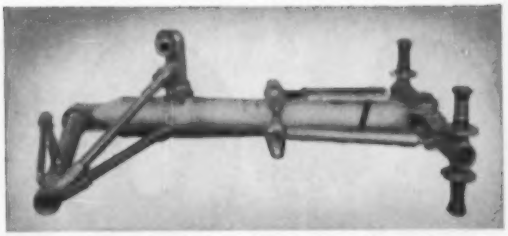
Whether your product must move lightly, stand still, look beautiful, or fight corrosion . . . the Republic Technical Man and his background of experience are prepared to serve you.

The coupon below will bring you information about Republic Titanium, Republic Stainless Steels, and Republic Alloy Steels.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

LATEST FACTS ABOUT REPUBLIC TITANIUM



WHAM! EVER THINK OF THE TREMENDOUS STRAIN on the landing gear when the huge aircraft you are in hits the runway at high speed? Don't worry, the landing gear can take it. Republic Alloy Steels provide the high strength and toughness needed to withstand high impact and heavy loads in aircraft landing gear—provide the hardenability to resist wear on bearing surfaces.

REPUBLIC HIGH STRENGTH STRUCTURAL BOLTS provide a new, fast, economical way to fasten structures permanently. Bolting reduces noise. Replaces field riveting. Is often safer and easier than other methods. Work usually is done from within structure, eliminating costly scaffolding. Made in accordance with ASTM Spec. A325. Bolts marked for easy identification to conform to Spec. for Assembly of Structural Joints, 2-27-54, Research Council on Riveted and Bolted Construction.

SAVE UP TO 25% IN WEIGHT, EVEN 50% with Republic High Strength Steel. Yes, when you engineer earth moving equipment, truck and gasoline trailers, railroad cars, and other mobile equipment to take full advantage of the high strength, low weight and corrosion-resistance of Republic High Strength Steel, you can cut weight up to 50%. And you can lengthen equipment life, too.

REPUBLIC STEEL CORPORATION
3104 East 45th Street
Cleveland 27, Ohio

Please send me more information on:

☐ Titanium ☐ High Strength Bolts
☐ High Strength Steel ☐ Alloy Steels

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

K-8281

C-O-MATIC

NOW! Weld even mild and

announced by A. O. Smith

medium carbon steels automatically...

new gas-shielded metal arc process uses Carbon Dioxide to shield the arc

ON GAS ALONE **in one year's time (3 shifts per day, 260 days), a single C-OMATIC unit saves you *$14,902.00 over Argon, $15,367.00 over Helium.***

● **NEW ECONOMY** thanks to use of less-costly Carbon Dioxide . . . thanks to low maintenance requirements of functional design.

● **X-RAY QUALITY WELDS** — Strength and ductility — yours with C-OMATIC.

● **VISIBLE ARC** means faster, easier welding . . . quick, convenient spotting of nozzle. (When required, C-OMATIC is easily convertible to submerged arc, too.)

● **DEEP PENETRATION** further assures high quality welds. No slag to remove . . . no flux to clean up.

● **ACCURATE CONTROL SYSTEM** of constant current design maintains preset arc voltage without fluctuation. No complex electronic circuits! Auxiliary controls available.

● **POWER SOURCE** — The service-proved A. O. Smith d-c rectifier.

Chart illustrates astonishing savings

	HELIUM	C-OMATIC	YOUR SAVINGS
Gas consumption per hour	70 cu. ft.	30 cu. ft.	40 cu. ft.
Cost of gas per cu. ft.	$0.067	$0.01	$0.057
Cost of gas per hour	$4.69	$0.30	$4.39
Cost per hour 60% of duty cycle	$2.81	$0.18	$2.63
Cost per day (3 shifts, 22.5 hours)	$63.20	$4.05	$59.15
Cost per year (260 days)	$16,420	$1,053	$15,367

	ARGON	C-OMATIC	YOUR SAVINGS
Gas consumption per hour	60 cu. ft.	30 cu. ft.	30 cu. ft.
Cost of gas per cu. ft.	$0.09	$0.01	$0.08
Cost of gas per hour	$5.40	$0.30	$5.10
Cost per hour 50% of duty cycle	$2.70	$0.15	$2.55
Cost per day (3 shifts, 22.5 hours)	$60.80	$3.38	$57.42
Cost per year (260 days)	$15,780	$878	$14,902

GET ALL THE FACTS NOW! Write for free booklet describing C-OMATIC in detail. Welding Products Division, A. O. Smith Corporation, Milwaukee 1, Wisconsin.

See C-OMATIC in action at the National Metals Exposition in Philadelphia... October 17 to 21... Booth 1842.

Through research ...*a better way*

A.O.Smith

CORPORATION

WELDING PRODUCTS DIVISION
Milwaukee 1, Wisconsin
INTERNATIONAL DIVISION: MILWAUKEE 1, WIS.

ELECTROMET

TRADE-MARK

ALLOYS FOR THE STEEL, IRON, AND NON-FERROUS INDUSTRIES

BORON ALLOYS

Ferroboron Min. 10.00% Boron Grade	Aluminum ...max. 0.50% Carbon .....max. 1.50%	Increases hardenability of steel; also, for additions to malleable iron and aluminum alloys.
Min. 17.50% Boron Grade	Aluminum ...max. 0.50% Carbon .....max. 0.50%	
Manganese-Boron	Boron .....min. 17.50% Manganese ..approx. 75% Carbon .....max. 3% Iron .....max. 5%	Used to cleanse and deoxidize non-ferrous alloys.

CALCIUM ALLOYS

Calcium-Silicon	Calcium .....30 to 33% Silicon .....60 to 65% Iron .....1.50 to 3%	Deoxidizer for high-quality steel. Also used in high-tensile gray irons.
Calcium-Manganese-Silicon	Calcium .....16 to 20% Manganese ...14 to 18% Silicon .....53 to 59%	A complex deoxidizer used widely in production of steel castings.
Calcium Metal Regular Grade	Calcium .....98% Balance largely Calcium Chloride	Deoxidizer and degasifier for steel and non-ferrous metals.
Distilled Grade	Calcium..approx. 99.50% Balance largely Magnesium	For special applications requiring calcium of very high purity.

CHROMIUM ALLOYS

"Simplex" Low-Carbon Ferrochrome No. 1	Chromium ....63 to 66% Silicon .....5 to 7% Carbon ....max. 0.010% or 0.025%	Suitable for all grades of steel containing chromium, and especially designed for stainless and high-alloy steels where substantial quantities of chromium are required. The silicon in the No. 1 alloy provides means of reducing metal oxides back from the slag and also increases the rate of solubility of the ferrochrome, thus providing a saving in furnace time. For those applications where high silicon is undesirable, "Simplex" No. 2 has been designed to provide an alloy which gives the desired characteristics of very close carbon control together with high chromium recoveries.
2% Nitrogen-Bearing Grade	Chromium ....62 to 65% Silicon ..... 5 to 7% Nitrogen .....2 to 2.5% Carbon ....max. 0.025%	
5% Nitrogen-Bearing Grade	Chromium ....60 to 63% Silicon .....5 to 7% Nitrogen .....5 to 6% Carbon ....max. 0.025%	
"Simplex" Low-Carbon Ferrochrome No. 2	Chromium ....63 to 66% Silicon .....max. 1.50% Carbon .....max. 0.03%	
2% Nitrogen-Bearing Grade	Chromium ....62 to 65% Silicon .....max. 1.50% Nitrogen .....2 to 2.5% Carbon .....max. 0.03%	
5% Nitrogen-Bearing Grade	Chromium ....60 to 63% Silicon .....max. 1.50% Nitrogen .....5 to 6% Carbon .....max. 0.03%	
Low-Carbon Ferrochrome (Other Grades)	Chromium ....67 to 71% Silicon ...0.30 to 1.00% Carbon (10 Grades) max. 0.02 to max. 2.00%	Production of stainless steels and high-temperature alloys requiring low carbon content.
High-Carbon Ferrochrome 2.25 to 3.00% Carbon Grade	Chromium ....66 to 70% Silicon .....max. 2% Sulphur .....max. 0.03%	Suitable for the production of all grades of alloy steel, including the high alloys, such as stainless steel.
Max. 4.50, 5.00, or 6.00% Carbon Grade	Chromium ....67 to 70% Silicon .....1 to 2%	
Max. 7.00% Carbon Grade	Chromium ....66 to 69% Silicon .....1 to 3%	
Min. 7.00% Carbon Grade	Chromium ....65 to 68% Silicon .....1 to 3%	
57 to 64% Chromium Grade	Carbon .....3.5 to 5% Silicon .....2 to 4.5%	
Nitrogen-Bearing Low-Carbon Ferrochrome	Chromium ....65 to 70% Silicon ...0.30 to 1.00% Carbon .....max. 0.10% Nitrogen ..0.75 to 2.00%	For additions of nitrogen to improve properties of high-chromium steels.
"SM" Ferrochrome	Chromium ....60 to 65% Silicon .....4 to 6% Carbon .....4 to 6% Manganese ....4 to 6%	A high-solubility chromium addition for steel or iron in either furnace or ladle.

CHROMIUM ALLOYS cont.

Exothermic Ferrochrome 5	Chromium ..approx. 50% Carbon ....approx. 2.5%	These improved exothermic ladle alloys have high solubility, low carbon pickup, and high ignition temperature.
Exothermic Ferrochrome 8	Chromium ..approx. 48% Carbon .....approx. 4%	
Exothermic Silicon-Chrome	Chromium ..approx. 46% Silicon .....approx. 23% Carbon .....max. 1.00%	
Foundry Ferrochrome High-Carbon Grade	Chromium ....62 to 66% Silicon .....7 to 10% Carbon .....5 to 7%	A high-solubility ferrochrome, developed especially for ladle additions of chromium to cast iron.
Low-Carbon Grade	Chromium ....50 to 54% Silicon .....28 to 32% Carbon .....max. 1.25%	
Chromium Metal High-Carbon Grade	Chromium ....87 to 90% Carbon .....9 to 11% Iron .....max. 1.25%	For production of a wide variety of chromium-bearing alloys, including electrical resistance alloys and high-temperature alloys.
Electrolytic Grades Laboratory Grade	Chromium ..min. 99.20% Iron .....max. 0.03%	
Commercial Grade	Chromium ..min. 99.00% Iron .....max. 0.30%	
"EM" Ferrochrome-Silicon	Chromium ....39 to 41% Silicon .....42 to 46% Carbon .....max. 0.05%	Used essentially in the production of stainless steel.
"EM" Ferrosilicon-Chrome	Chromium ....50 to 54% Silicon .....28 to 32% Carbon .....max. 1.25%	For adding chromium and silicon to steels containing up to 1 or 2 per cent chromium.
"EM" Chromium Briquets (Hexagonal Shape)	Chromium .....2 lb. Total Weight .....3¾ lb.	For adding chromium to cast iron in the cupola.

COLUMBIUM ALLOYS

Ferrocolumbium	Columbium ...50 to 60% Silicon .....max. 8% Carbon .....max. 0.40%	Stabilizer in austenitic chromium-nickel stainless steels. Also constituent of high-temperature alloys.
Ferrotantalum-Columbium	Columbium ..approx. 40% Tantalum ...approx. 20% Cb + Ta .....min. 60% Carbon .....max. 0.30% Iron .....approx. 25%	Used to supplement ferrocolumbium in chromium-nickel stainless steels and high-temperature alloys.

MANGANESE ALLOYS

Standard Ferromanganese Regular Grade	Manganese ...74 to 76% Carbon .....approx. 7% Silicon .....max. 1%	Most common means of adding manganese to steel for both alloying and deoxidizing purposes. Also for counteracting sulphur in steel and cast iron.
Low-Phosphorus Grade	Manganese ...78 to 80% Carbon .....max. 7% Silicon .....max. 2% Phosphorus ..max. 0.10%	
Low-Carbon Ferromanganese Low-Phosphorus Grade	Manganese ....min. 90% Carbon .....max. 0.07% Phosphorus ..max. 0.06%	Used for making additions of manganese to steels of low-carbon specification, particularly stainless steels.
Regular Grades	Manganese ...85 to 90% Carbon ..max. 0.07, 0.10, 0.15, 0.30 or 0.50%	
Regular Grade (High-Silicon)	Manganese ...80 to 85% Carbon .....max. 0.75% Silicon .....5 to 7%	
"Mansiloy" Alloy	Manganese ...60 to 63% Silicon .....28 to 31% Carbon .....max. 0.07% Phosphorus ..max. 0.05%	Used essentially in the production of stainless steels.
Silicomanganese Max. 1.50% Carbon Grade	Manganese ...65 to 68% Silicon .....18 to 20%	A versatile alloy useful as a furnace block and deoxidizer, and also for an alloy addition to steel in the ladle or furnace.
Max. 2.00% Carbon Grade	Manganese ...65 to 68% Silicon ....15 to 17.50%	
Max. 3.00% Carbon Grade	Manganese ...65 to 68% Silicon ....12 to 14.50%	

All of the alloys and metals listed are produced in the usual lump, crushed, or ground sizes, except where other special forms are indicated.

MANGANESE ALLOYS cont.

Medium-Carbon Ferromanganese	Manganese ...80 to 85% Carbon ...1.25 to 1.50% Silicon.max. 1.00 or 1.50%	An intermediate carbon ferromanganese alloy for addition to steel.
Low-Iron Ferromanganese	Manganese ...85 to 90% Carbon ...approx. 7.00% Silicon .....max. 3% Iron .....max. 2%	For high manganese additions to certain non-ferrous alloys, particularly aluminum.
Manganese Metal Electrolytic Grade	Manganese .min. 99.90%	Used wherever manganese of high purity is required in the production of stainless steel and non-ferrous alloys.
Nitrogen-Bearing Grade	Manganese ..approx. 93% Nitrogen ....approx. 6%	
"EM" Silico-manganese Briquets (Square Shape)	Manganese .....2 lb. Silicon .....½ lb. Total Weight .....3½ lb.	For adding manganese (with silicon) to cast iron in the cupola.
"EM" Ferro-manganese Briquets (Oblong Shape)	Manganese .....2 lb. Total Weight .....3 lb.	For adding manganese (without silicon) to cast iron in the cupola.

SILICON ALLOYS

50% Ferrosilicon Regular Grade	Silicon .....47 to 51%	Deoxidizer for most grades of killed or semi-killed steel. The blocking grade is specially sized for maximum efficiency.
Blocking Grade	Silicon .....47 to 51%	
Boron-Bearing Grade	Silicon .....47 to 51% Boron ...0.04 to 0.05% Or higher if desired	
Low-Aluminum Grade	Silicon .....47 to 51% Aluminum ...max. 0.40% or 0.10%	
65% Ferrosilicon Regular Grade	Silicon .....65 to 70%	For furnace or ladle addition to steels. Commonly used for production of electrical sheet steel.
Low-Impurity Grade	Silicon ..61.50 to 66.50% Aluminum ...max. 0.50% Total Impurities max. 1.00%	
75% Ferrosilicon Regular Grade	Silicon .....73 to 78%	Deoxidizer and alloy for production of high-silicon spring and electrical sheet steel. Graphitizing inoculant for cast iron.
Low-Aluminum Grade	Silicon .....73 to 78% Aluminum ...max. 0.50%	
85% Ferrosilicon Regular Grade	Silicon .....83 to 88%	Enables melter to add higher percentages of silicon without chilling metal in ladle. Graphitizing inoculant for cast iron.
Calcium-Bearing Grade	Silicon .....83 to 88% Calcium ....min. 0.50%	
Low-Aluminum Grade	Silicon .....83 to 88% Aluminum ...max. 0.50%	
90% Ferrosilicon Regular Grade	Silicon .....92 to 95%	Permits large additions of silicon without harmful chilling effect.
Low-Aluminum Grade	Silicon .....92 to 95% Aluminum ...max. 0.50%	
Silicon Metal Regular Grade	Silicon min. 98 or 96.50% Iron..max. 0.75 or 1.50% Calcium ....max. 0.07%	Additions of silicon to non-ferrous metals, particularly aluminum and copper.
Purified Grade	Silicon ..99.70 to 99.90% Iron .....005 to .015%	For applications in non-ferrous industry requiring silicon of high purity.
Low-Calcium Grade	Silicon .....min. 98% Iron .....max. 0.75% Calcium ....max. 0.03%	For high-silicon aluminum alloys where calcium is detrimental.
Low-Aluminum Grade	Silicon .....min. 98.50% Iron .....max. 0.75% Aluminum ...max. 0.10% Calcium ....max. 0.03%	For the production of silicon-copper alloys where aluminum is detrimental.
"EM" Silicon Briquets		
Large Size (Cylindrical or Brick-Shape)	Silicon .....2 lb. Total Weight .....5 lb.	For adding silicon to cast iron in the cupola.
Small Size (Cylindrical Shape)	Silicon .....1 lb. Total Weight .....2½ lb.	

SILICON ALLOYS cont.

"SMZ" Alloy	Silicon .....60 to 65% Manganese ....5 to 7% Zirconium .....5 to 7%	Particularly strong graphitizing inoculant used in cast iron.
Magnesium-Ferrosilicon Regular Grade	Silicon .....43 to 47% Magnesium ..7.5 to 9.5%	For addition to cast iron and steel to obtain special properties.
Cerium-Bearing Grade	Cerium ...approx. 0.50%	

TITANIUM ALLOYS

Ferrotitanium	Titanium ..27 to 32%, 50 to 55%, or approx. 70% Carbon .....max. 0.10%	For stabilized stainless steels and high-temperature metals.
Silicon-Titanium	Titanium .....40 to 50% Silicon .....45 to 50% Iron .....max. 3%	For additions of titanium to steel, cast iron, or nonferrous alloys.
Manganese-Nickel-Titanium	Titanium ...approx. 48% Nickel .....approx. 31% Manganese .approx. 6%	For adding nickel and titanium to high-temperature alloys.

TUNGSTEN ALLOYS

Ferrotungsten	Conforming to A.S.T.M. Spec. A 144-50	Production of tool and die steels; also high-temperature alloys.
Tungsten Metal Powder Melting Grade	Tungsten ...min. 98.80% Total Carbon..max. 0.25%	Production of tungsten steels and cast tungsten carbide.
Calcium Tungstate	Tungstic Oxide.68 to 72%	For making tungsten chemicals and other tungsten products.
Calcium Tungstate Nuggets	Tungstic Oxide.68 to 72%	For producing tool steels and high-temperature alloys.
Ammonium Paratungstate	Tungstic Oxide.min. 88.7%	Intermediate for tungsten products.

VANADIUM ALLOYS

Aluminum-Vanadium	Vanadium ....80 to 85% Aluminum ....13 to 16% Iron .....max. 1% Silicon .....max. 1% Oxygen .....max. 0.25%	For adding aluminum and vanadium to titanium metal and alloys.
Ferrovanadium	Vanadium ....50 to 55% or 70 to 75% Carbon ..max. 0.20, 0.50, or 3.00% Silicon ..max. 1.50, 2.00, or 8%; and approx. 10%	Production of tool and engineering steels, high-strength structural steels, non-aging rimming steels, and wear-resistant irons.
Vanadium Oxide Fused	V_2O_5 .....86 to 89% Na_2O .....approx. 10% CaO .....approx. 2%	For addition of vanadium to steel and for manufacturing catalysts.
Sodium Polyvanadate (Red Cake)	V_2O_5 .....approx. 85% Na_2O .....approx. 9%	
High-Purity Ammonium Metavanadate	V_2O_5 ....approx. 99.50% NH_4VO_3 .....min. 99%	For manufacture of vanadium compounds, including vanadium catalysts.

ZIRCONIUM ALLOYS

12 to 15% Zirconium Alloy	Zirconium ....12 to 15% Silicon .....39 to 43% Carbon .....max. 0.20%	A powerful deoxidizer. Also increases depth of hardening of steel.
35 to 40% Zirconium Alloy	Zirconium ....35 to 40% Silicon .....47 to 52% Carbon .....max. 0.50%	Steel deoxidizer when higher concentration of zirconium is desired.
"EM" Zirconium Briquets (Cylindrical Shape, Red Color)	Zirconium .....0.55 lb. Silicon .....1.90 lb. Total Weight .....5 lb.	For adding zirconium and silicon to cast iron in the cupola.

"Electromet," "EM," "Mansiloy," "Simplex," "SM," and "SMZ," are trade-marks of Union Carbide and Carbon Corporation.

IF YOU HAVE A METALS PROBLEM

More than 50 different alloys and metals are produced by ELECTROMET. If you need help in selecting the proper alloys, be sure to consult one of ELECTROMET'S specially trained metallurgists and engineers. Address your inquiries to one of the offices listed at right.

Birmingham 1, Ala.....P.O. Box 196
Chicago 1, Ill.....230 N. Michigan Avenue
Cleveland 14, Ohio.....1300 Lakeside Avenue
Detroit 21, Mich.....10421 West Seven Mile Road
Houston 11, Texas.....6119 Harrisburg Boulevard
Los Angeles 58, Calif.....2770 Leonis Boulevard
New York 17, N. Y.....30 East 42nd Street
Pittsburgh 22, Pa.....Oliver Building
San Francisco 6, Calif.....22 Battery Street
In Canada: Electro Metallurgical Company, Division of Union Carbide Canada Limited, Welland, Ontario

ELECTRO METALLURGICAL COMPANY A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.

TENAC

..HOUGHTON'S TENACIOUS OPEN GEAR AND CABLE LUBRICANT

adheres to gears longer ...reduces lubricating costs!

TENAC provides a long-lasting cushion to protect moving metal parts and is recommended for the heaviest gear and cable applications. Its advantages stand out over ordinary types:

- No preheating necessary.
- Easily applied by brush, spray, drip feed, or swab.
- Fast-setting film won't become brittle or flake off.
- Has high lubricity and oiliness.
- Water resistant—corrosion-preventive.
- Remains fluid in storage.
- High penetration ability.
- No chlorinated or toxic dilutions.
- High flash point reduces evaporation and fire hazard.

Get more detailed information from the Houghton Man or write to E. F. Houghton & Co., 303 West Lehigh Avenue, Philadelphia 33, Pa.

AVAILABLE IN 3 GRADES

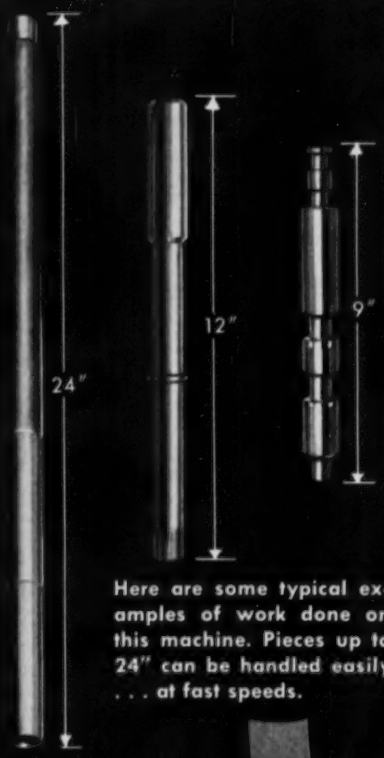
Tenac L . . . Light
Tenac M . . . Medium
Tenac H . . . Heavy

TENAC *a product of...*

E. F. HOUGHTON & CO.
PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .

impossible to machine long parts **AUTOMATICALLY** on your present equipment?



Here are some typical examples of work done on this machine. Pieces up to 24″ can be handled easily . . . at fast speeds.

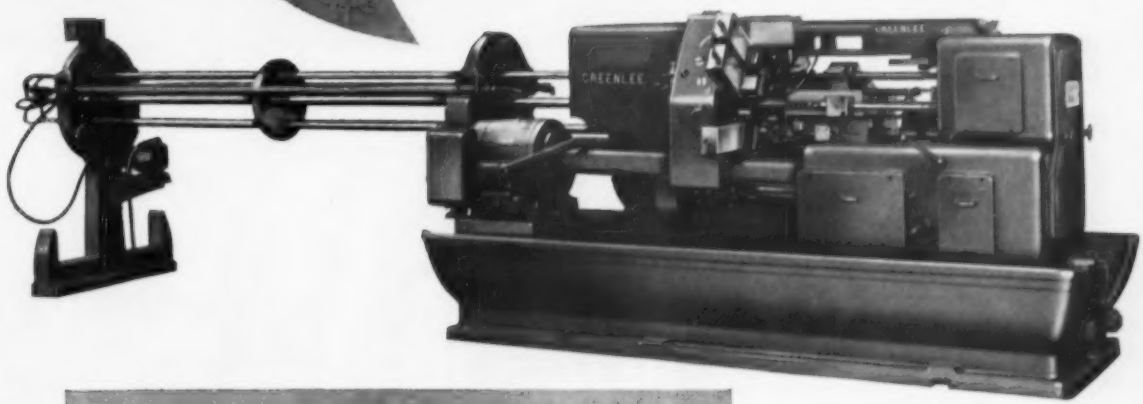
IT'S EASY... IT'S ECONOMICAL

with a GREENLEE SIX-SPINDLE BAR

AIR-FEED AUTOMATIC

This machine puts you in an enviable competitive position. Production goes up . . . costs go down. Check its many advantages: (1) Feeds out stock to 24″ (2) Has multiple feed-out (3) Eliminates stock scoring (4) Reduces stock reel noise (5) Eliminates stock pushers and feed-out cams. Especially worth noting is the fact that the stock can be fed out in one or more positions during either the index cycle or feed cycle.

Additional data will gladly be sent on request. Write today.

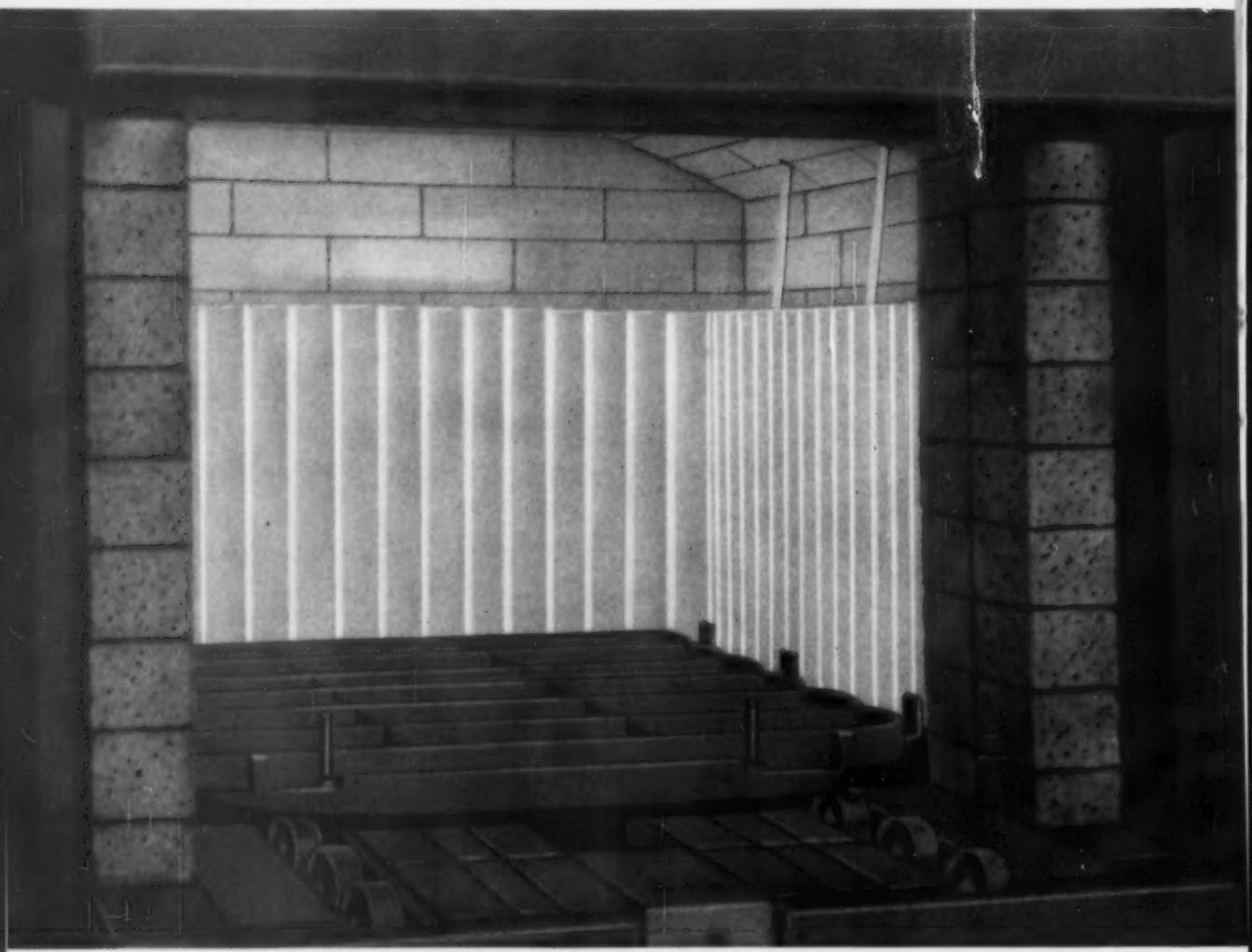


GREENLEE

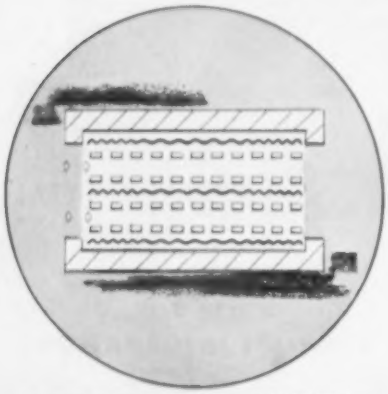
GREENLEE BROS. & CO.
1810 Mason Ave.
Rockford, Illinois

WRITE FOR COMPLETE INFORMATION

BRAND NEW – MODERN ELECTRIC ELEMENT

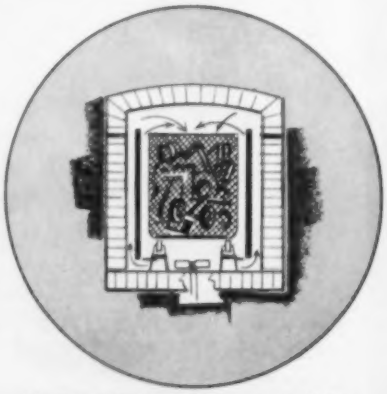


This shows graphically how the new Lindberg CORRTHERM electric heating element actually fills the furnace with walls of glowing heat. Note also that CORRTHERM is conveniently hung from simple brackets requiring no complicated connections or construction. This element operates at extremely low voltage, eliminating shock or short hazards.



In continuous type furnaces CORRTHERM elements hang between lines of work as well as on side walls. Note how closer corrugations (at each end of element) compensate for incoming cold work and door losses.

CORRTHERM elements act as natural baffles to direct forced convection streams through the charge. The use of electric furnaces for carburizing and carbonitriding now becomes completely practical.



No retort needed in pit-type carburizing furnace with CORRTHERM elements. Again see how elements serve as baffles to direct forced convection stream through charge.

FOR LINDBERG FURNACES

Never before has there been an electric heating element like this CORRTHERM by Lindberg. Its revolutionary advantages now make the use of electricity as the source of heat, practical, efficient and economical for all heat treating processes.

Ideal for use in any electric heat treating furnace, CORRTHERM elements have particular advantages for carburizing and carbonitriding. This new element completely eliminates problems formerly created by the use of electricity in these types of furnaces. These exclusive advantages of CORRTHERM explain how and why:

LOW VOLTAGE: Operates at extremely low voltage. No leakage through carbon saturation. Around Lindberg we talk about it as the electric element "without any electricity . . . to speak of!"

ATMOSPHERE CIRCULATION: Elements act as baffles to direct circulation of convection streams.

SAFETY: Extremely low voltage also eliminates shock or short hazards.

DURABILITY: Watts density at all-time low. Element practically indestructible. Work load or operator's charging tool can't hurt it.

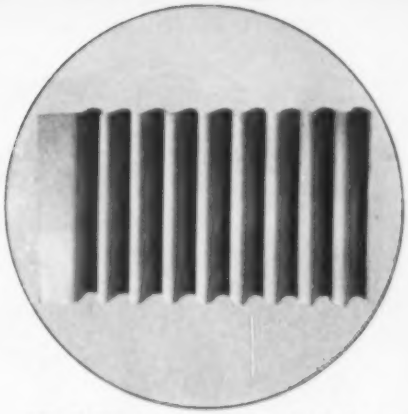
EASILY INSTALLED: Element is not enclosed, just hangs in furnace. No complicated mountings required.

If electricity is the preferable source of heat for your metal treating processes find out how advantageously CORRTHERM elements can be applied to your requirements. Just get in touch with your nearest Lindberg Field Representative. (Consult your classified phone book.)

See CORRTHERM at ASM Show. The new CORRTHERM element will have its first public showing at the ASM Show in Philadelphia, October 17 to 21. Plan to see this and many other new developments by Lindberg in the furnace and related fields in the Lindberg Booth No. 230.

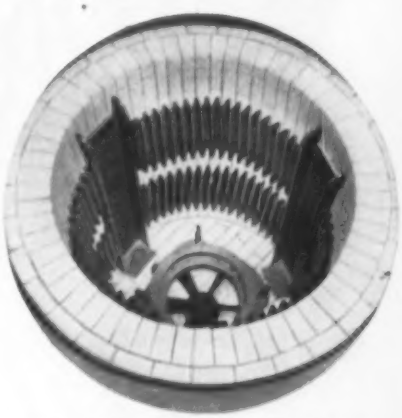
LINDBERG ENGINEERING COMPANY

2452 West Hubbard Street, Chicago 12, Illinois
Los Angeles Plant: 11937 Regentview Ave., at Downey, California



CORRTHERM elements are large sheets of corrugated nickel chromium. They were developed in Lindberg laboratories by Lindberg metallurgists and engineers.

This shows installation of CORRTHERM elements in one of two large rotary furnaces currently being erected in the field by Lindberg's associate company, Lindberg Industrial Corporation.



An installation of CORRTHERM elements in a carburizing pit-type furnace. Simplicity of mounting makes replacement easy and economical.

Safety! Extremely low voltage makes CORRTHERM elements completely safe. Let operator or work load bang it if they will. Neither element nor operator will be hurt.

CORRTHERM

by LINDBERG

take the GAMBLE out of Gear Buying

Spur
Helical
Spur Internal
Helical Internal
Rack
Herringbone
Worm
Non-Metallic
Splines
Coniflex Bevel
Spiral Bevel
Zerol
Hypoid
Intermittent
Sprockets

Contract Machine Work

BE ABSOLUTELY SURE of accuracy and highest quality gearing, also prompt personal attention, regardless of whether you are in need of one gear or a thousand. **There's no "gamble"** when you order from "Phillie Gear" . . . Our two large, modern plants, skilled gear craftsmen and over 63 years experience, will assure you of complete satisfaction.

NEW and FREE . . . our 76 page GEAR BOOK. It's practically a "Treatise" on the subject of gears and gearing. Kindly use your Business Letterhead when requesting copy.

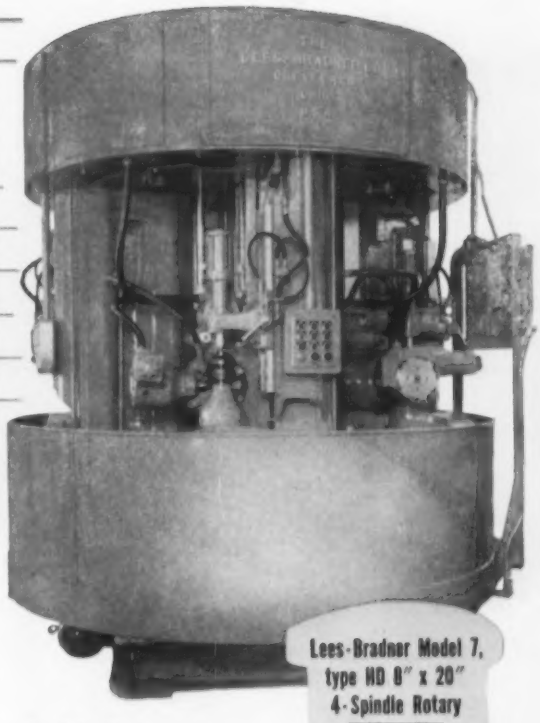
PHILADELPHIA GEAR WORKS
INCORPORATED

ERIE AVE. AND G ST., PHILADELPHIA 34, PA.
NEW YORK • PITTSBURGH • CHICAGO • HOUSTON • LYNCHBURG, VA.
BALTIMORE • CLEVELAND
Virginia Gear & Machine Corp., Lynchburg, Va.
Industrial Gears & Speed Reducers • LimiTorque Valve Controls
Established 1892

LEES-BRADNER

Sets the HOBBING pace for tomorrow

with 4 machines in 1



Lees-Bradner Model 7, type HD 8" x 20" 4-Spindle Rotary Hobber. Also available in single and 6-spindle models.

Here's a complete hobbing production line in one space-saving unit.

Actually the Lees-Bradner Model 7, Type HD 4-Spindle Hobber is four separate and independently operative machines in one. Each hobbing unit incorporates basically the same automatic, high-production features as the remarkable 7 type HD Single Spindle Hobber. This includes a heavier, more rugged headstock, heavy-duty column and a 10 H.P. motor.

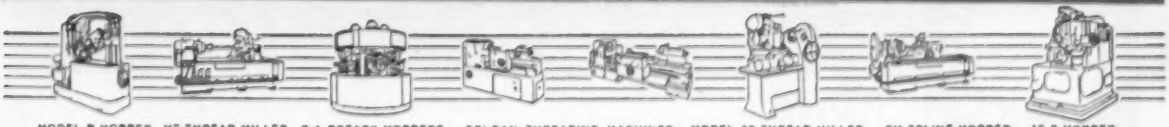
This amazingly efficient machine not only saves valuable floor space but, with its pushbutton controls and automatic features, actually controls the operator thus reducing the chance for human error or slowdown. Chips and coolant are easily carried away from the headstock by the elimination of flat surfaces.

So, if your manufacturing space is valuable and high unit production important, ask your Lees-Bradner representative to give you the story on the ultra-efficient 4-spindle rotary hobber. Write or wire us direct for his name and address in your area.

View of new Type HD headstock with increased bearing surface between column and headstock, heavier casting, coolant and chip carry-away.

the LEES-BRADNER Company

CLEVELAND 11, OHIO, U.S.A.



MODEL R HOBBER · HT THREAD MILLER · 7-A ROTARY HOBBERS · CRI-DAN THREADING MACHINES · MODEL 40 THREAD MILLER · 8H SPLINE HOBBER · 12-9 HOBBER

IF YOU THREAD OR HOB . . . GET A BETTER JOB WITH A LEES-BRADNER

gives complete, automatic arc control

IN ANY WELDING POSITION:

...overhead
...vertical
...downhand

an exclusive feature

of the new VICKERS® *Controlarc*

magnetic amplifier-rectifier *DC Welder*

in 200, 300, 400 Ampere Models

- Easy, Clean Arc Strikes
- Hot Starts, Immediate Penetration
- Fast Arc Recovery
- No Arc "Pop Outs"
- No Current Drop-Off During Pass
- Uniform Fusion, Steady Rate of Metal Deposit
- Adaptable to Heli-Arc or Other Inert Gas Conversions

WRITE TODAY for new bulletin

Territories open for qualified dealers. Write for details

VICKERS ELECTRIC DIVISION

VICKERS Inc. a unit of Sperry Rand Corporation

1857 LOCUST STREET • SAINT LOUIS 3, MISSOURI

This customer saved 46% in freight charges

on these stainless steel plates

THESE STAINLESS sketch plates, produced by G. O. Carlson, Inc., saved the customer 46% in shipping costs. If he had bought rectangular plates and done his own cutting, he would have paid freight on excess material which he could not use.

Then too, cutting and machining facilities were quite limited at the job site. Time and money were saved by having Carlson cut and machine the plates to the accurate tolerances specified.

For your next work involving stainless steel plates, heads and other stainless products, let us show you how—*and how much*—you save by buying from G. O. Carlson, Inc.

Stainless Steels Exclusively

G. O. CARLSON, INC.

Plates • Plate Products • Forgings • Bars • Sheets (No. 1 Finish)

THORNDALE, PENNSYLVANIA

District Sales Offices in Principal Cities

Use WELDED STEEL
for Greater Strength
with Less Weight!

Thousands of weldments of many shapes, sizes and weights are produced by Mahon every year. Those illustrated here are typical of parts and assemblies produced for manufacturers of processing machinery, machine tools, and other types of heavy mechanical equipment. If you require parts or assemblies, including large heavy pieces where time and pattern costs are a consideration, you can turn the job over to Mahon with complete confidence, because Mahon's service to users of welded structural or heavy plate fabrications is complete from design to finished machining and assembling. If you are a buyer of weldments, or welded steel in any form, you, too, will find in the Mahon organization a unique source . . . a source where design skill and advanced fabricating techniques are supplemented by craftsmanship which assures you a smoother, finer appearing job embodying every advantage of Steel-Weld Fabrication. See Sweet's Product Design File for information, or write for Booklet showing Mahon facilities and capabilities to serve you well.

THE R. C. MAHON COMPANY • Detroit 34, Michigan
SALES ENGINEERING OFFICES in NEW YORK and CHICAGO

Engineers and Fabricators of Steel in Any Form for Any Purpose

MAHON

FIRST

to inaugurate Employee Welfare in the Iron Ore Mining Industry

A special Welfare Department created in 1905 provides financial help in sickness, and death, and for medical treatment, for good housing at low rents and with excellent sanitary arrangements, for improving health conditions in the mines, and for increasing and extending educational opportunities for the employes and their families. A Pension System was instituted in 1909. The present-day towns on the iron ore ranges, with their alert and healthy citizens, churches, schools, community centers, clubs, summer and rest cottages, parks, etc., are eloquent testimonial of the success of the Cliffs Welfare Program.

LAKE SUPERIOR IRON ORE
VESSEL TRANSPORTATION
COAL • FERRO ALLOYS

THE Cleveland-Cliffs IRON COMPANY
UNION COMMERCE BUILDING • CLEVELAND 14, OHIO

TO THE FASTENER BUYER:

Lamson & Sessions has manufactured Aluminum fasteners for the aircraft industry for many years. Therefore their experience with aluminum goes back a long ways. Now, however, Lamson has added to its aluminum line standard fasteners from stock.

- **FAST DELIVERY**
- **COMPETITIVELY PRICED**
- **FULL RANGE OF TYPES & SIZES**

Here's good news for users of aluminum fasteners.

Lamson & Sessions has now added "standard" bolts, nuts, screws and cotters of aluminum alloy to its famous full line of fasteners.

Henceforth the products illustrated above will be readily available. They come in a wide range of standard sizes, including machine screws down to No. 6 diameter by ¼" in length.

This means that users of aluminum bolts and nuts can now buy at competitive prices with the added advantages of fast delivery and service.

From now on it will pay you to insist on Lamson & Sessions aluminum fasteners—made by one of the world's largest fastener manufacturers.

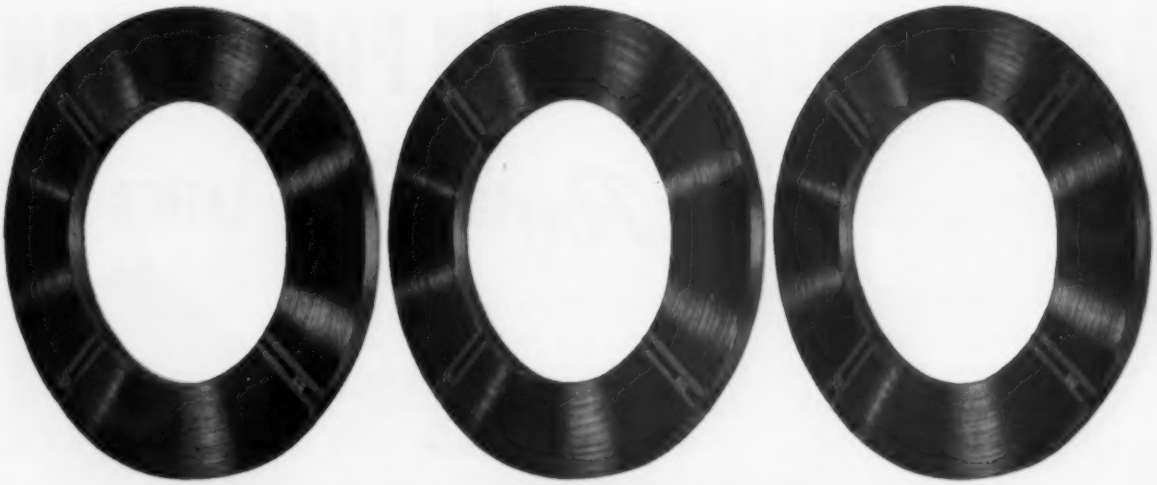
Lamson & Sessions

THE LAMSON & SESSIONS CO.

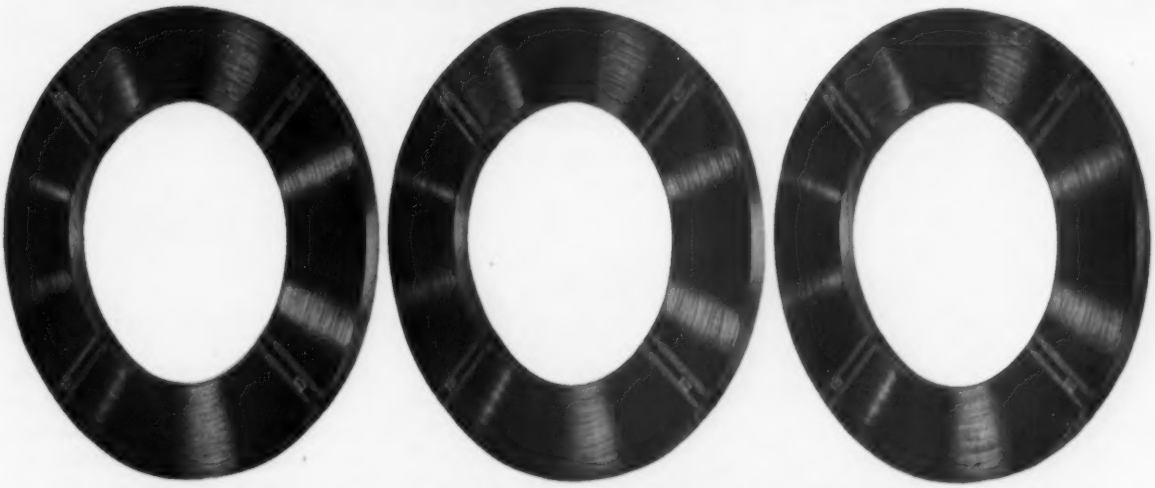
1971 WEST 85th STREET • CLEVELAND 2, OHIO

Plants at: Cleveland and Kent, Ohio • Birmingham • Chicago

LAMSON'S FASTENER EXPERIENCE IS NOW *YOURS* IN ALUMINUM



call CRUCIBLE for a



full range of COLD ROLLED specialty steels

Look to Crucible for highest quality cold rolled specialty steels. You'll find a wide assortment of alloy strip and carbon spring steels . . . in many analyses, sizes, shapes and finishes.

Crucible, the nation's leading producer of *special purpose steels*, controls steel production from ore to finished product. And special Crucible-patented machines bring you cold rolled steels with *finer* finish . . . better edges . . . closer than standard tolerances.

When you have a cold rolled specialty steel application, call Crucible in during the *planning* stage. Crucible engineers can help you develop the specification . . . and knowing the end use for the steel, will prescription-make it to suit your needs—in coils or cut to your particular length requirements. *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 30, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

A NEW PERSPECTIVE IN PRODUCTION

WITH LODGE & SHIPLEY *Powerturn* LATHES

It's time to take a new view of lathe economics. Whether the lathes in your plant are used for production or general purpose, you should be sure that they are producing as economically as possible. Lathes only a few years old may be liabilities from the standpoint of truly low cost production.

New Lodge & Shipley POWERTURN Lathes are designed in every way to facilitate turning to higher levels of profitable operation. Among many new features is the exclusive Computing Head which makes speed selection virtually automatic since the head indicates correct speed lever settings.

With all the new features, these Lathes offer traditional Lodge & Shipley rugged strength, power and accuracy. Get the facts now. "Up-date" lathe facilities for profitable production. Write for detailed literature: The Lodge & Shipley Co., 3055 Colerain Ave., Cincinnati 25, Ohio.

16" POWERTURN Engine Lathe
(also manufactured in 13" and 20" Standard sizes, in Toolmaker, Gap, Manufacturing and 45° and 90° COPYMATIC models)

more than ever before . . .
your LODGE-*ical choice is*

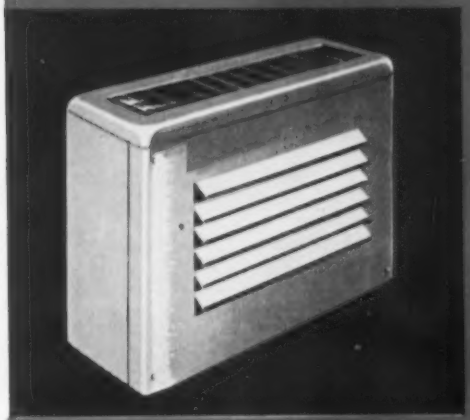
Lodge & Shipley

Why deep draws with

Weirzin

electrolytic zinc-coated sheets

provide important manufacturing economies



Because Weirzin has been proved to retain its amazingly uniform protective coating under extreme fabricating operations, it is specified by leading manufacturers for a wide variety of products.

Drawing and forming are performed rapidly, with complete absence of flaking, cracking, or peeling. Inventory losses due to rust are materially reduced. Heat and moisture are successfully resisted. Absence of underfilm corrosion assures not only longer life, but also adherence of paint, lacquer, enamel and lithograph ink. And, for even longer adhesion, chemically treated Weirzin is available.

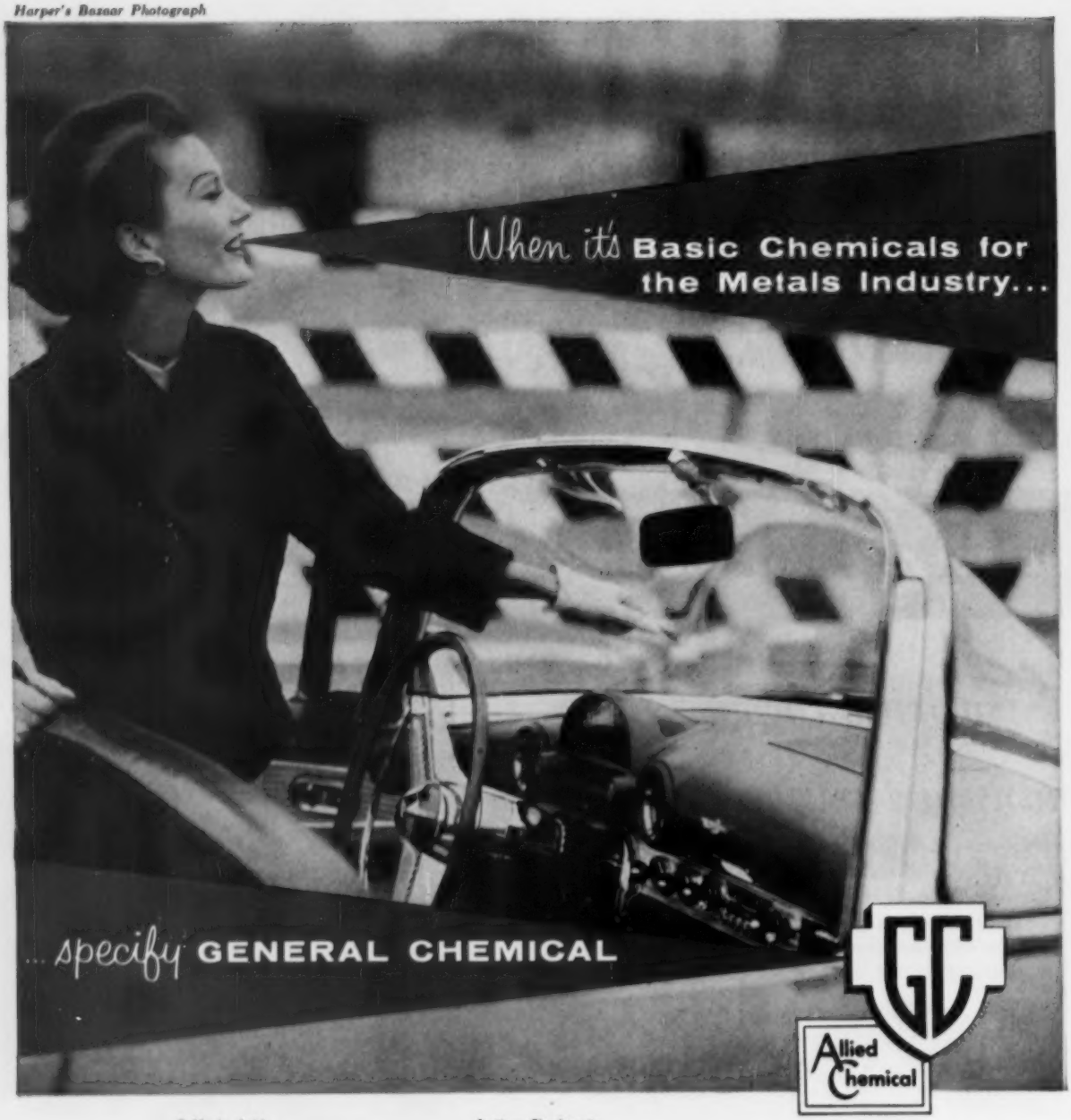
When the job calls for difficult deep draws, specify Weirzin and enjoy the double advantage of quality and economy.

WEIRTON STEEL COMPANY

Weirton, West Virginia

NATIONAL STEEL CORPORATION

Harper's Bazaar Photograph



Sulfuric Acid
Hydrochloric (Muriatic) Acid
Nitric Acid
Hydrofluoric Acid
Sodium Fluoride
Sodium Bifluoride
Trisodium Phosphate
Sodium Metasilicate
Oxalic Acid
Fluoboric Acid
Potassium Fluoborate

Sodium Fluoborate
Ammonium Fluoborate
Lead Fluoborate
Tin Fluoborate
Copper Fluoborate
Iron Fluoborate
Nickel Fluoborate
Cadmium Fluoborate
Other Heavy Chemicals

B&A Laboratory Reagents and Fine Chemicals

BASIC CHEMICALS FOR AMERICAN INDUSTRY

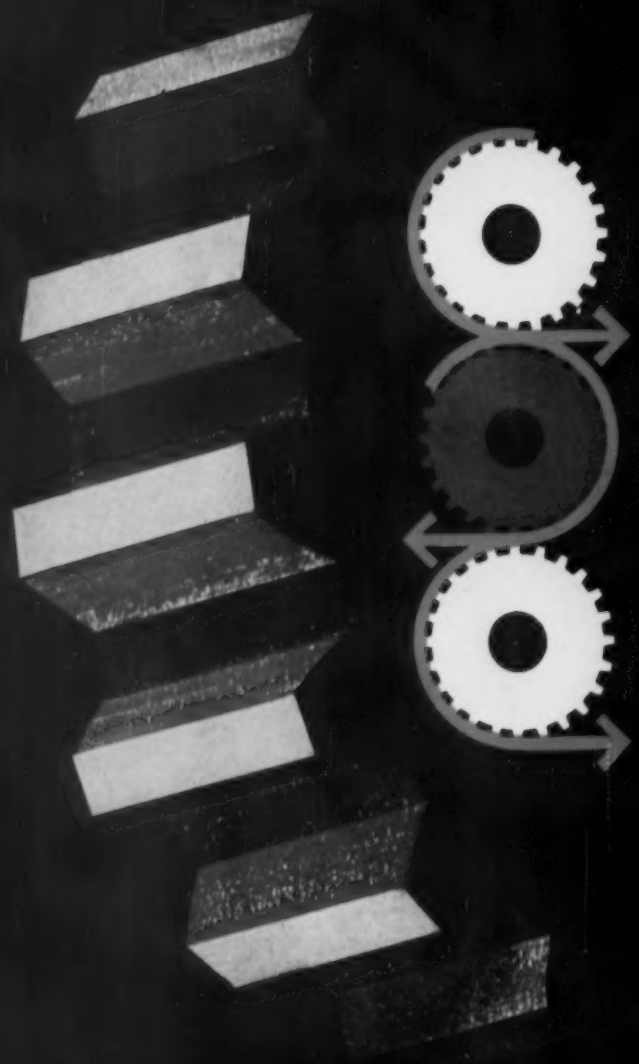
GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

Offices: Albany • Atlanta • Baltimore • Birmingham • Boston • Bridgeport • Buffalo • Charlotte Chicago • Cleveland • Denver • Detroit • Greenville (Miss.) • Houston • Jacksonville • Kalamazoo Los Angeles • Minneapolis • New York • Philadelphia • Pittsburgh • Providence • San Francisco Seattle • St. Louis • Yakima (Wash.) • In Wisconsin: General Chemical Company, Inc., Milwaukee

In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver

B-RIGHT-ON®
SOCKET SCREW PRODUCTS
always measure up!
QUALITY
B-RIGHT-ON
PRODUCTS
Socket screw users who want *what* they want *when* they want it know it pays to specify B-RIGHT-ON! Brighton Socket Screw Products *always* measure up.
Standard or special, Brighton Screws must meet and pass factory standards that are higher even than those specified by the ultimate user of the screws. Rigid control, from initial steel selection to final packaging, certifies every screw as B-RIGHT-ON quality.
Selected mill supply houses, Brighton distributors, complete the control chain, assure the user of service and delivery as dependable as the screws . . . B-RIGHT-ON service.
Write for descriptive literature . . . see how
YOU CAN DO BETTER WITH B-RIGHT-ON.
THE BRIGHTON SCREW & MANUFACTURING CO.
1829 READING ROAD CINCINNATI 2, OHIO

4150 steel is your best bet for heavy sections



Chromium Molybdenum Steel like AISI-SAE 4150 is the most economical way to uniform properties throughout heavy sections. For heavy duty gears — for shafts — wherever toughness and fatigue strength are important, *plentiful* 4100 Moly steels are better. We will prove it. Climax Molybdenum Company, 500 Fifth Ave., New York 36, N. Y.

AISI-SAE 4150

C 0.48/0.53	Mn 0.75/1.00	Pmax 0.040	Smax 0.040
Si 0.20/0.35	Cr 0.80/1.10	Mo 0.15/0.25	

4100 steels are your best bet

CLIMAX MOLYBDENUM

THE FERRY CAP

countr-bor

Trademark

SCREW

A NEW, REVOLUTIONARY DESIGN
FOR SOCKET HEAD SCREW APPLICATIONS

OFFERING THESE NOTEWORTHY ADVANTAGES:

1. Takes standard 12-point socket wrench.
2. External wrenching instead of internal.
3. Stronger—more gripping surface.
4. Permits greater wrenching torque.

Packaged goods being readied for distributors

In brief—a quality product which will do everything required of socket head screws—and more. For all counterbore applications.

Wherever the Ferry Cap Countr-Bor Screw has been tried, users are enthusiastic—saying that these screws are a service man's dream and the best development in socket screws in recent years. They will help you lick tough assembly problems where socket screws are required.

We shall be glad to send samples, prices and complete information promptly upon request.

Ferry Cap Countr-Bor Screws
PATENT APPLIED FOR
MANUFACTURED SOLELY BY

THE FERRY CAP & SET SCREW COMPANY
2157 Scranton Road • Cleveland 13, Ohio

why STAINLESS STEEL TUBING?

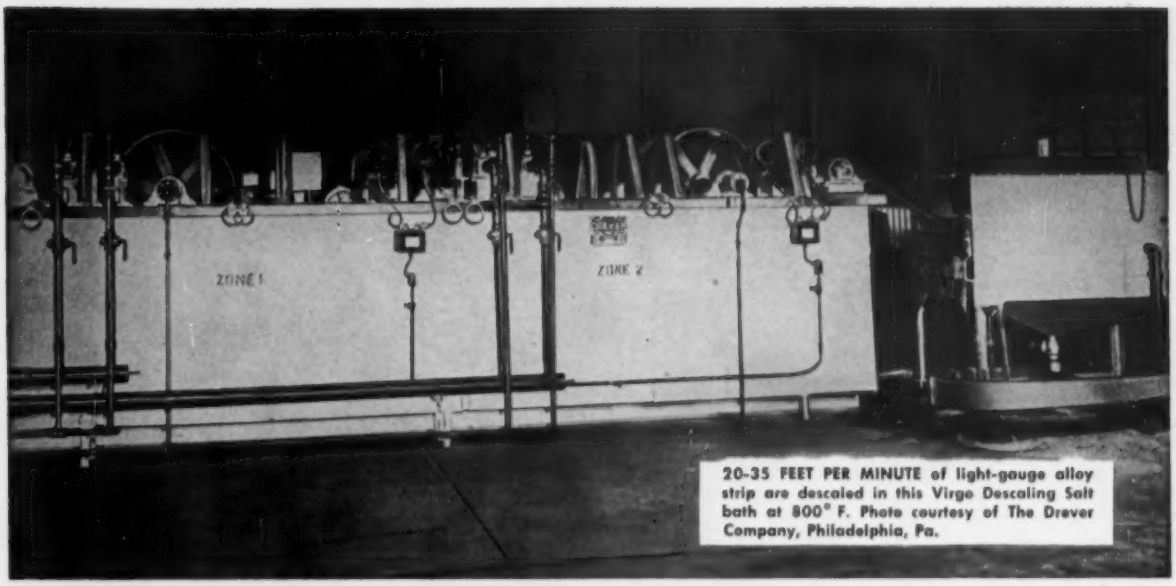
Selection of the proper grade of stainless steel tubing is essential because no single metal or alloy economically resists all corrosive conditions. As certain physical properties are required for specific applications, sometimes the consideration of corrosion resistance is neglected when the choice of tubing material is made. For example, if a degree of corrosion resistance can be imparted to ordinary steel by the use of a protective coating, and if replacement cost of the article is low, this may be the sensible course. But where replacement cost is high, or where contamination through corrosion may occur, the wisest, and in the long run the most economical choice of tubing, is a stainless steel of the correct analysis for the conditions of manufacture and service.

Get in touch with Mr. Tubes, your link to B&W, for a detailed comparison of grades suitable for your use and learn how to get more for your money with stainless. *Or write for Bulletin TDC-160. 1A.*

B&W
TUBULAR PRODUCTS DIVISION

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa. and Milwaukee, Wis.: Seamless Tubing, Welded Stainless Steel Tubing
Alliance, Ohio: Welded Carbon Steel Tubing
Milwaukee, Wis.: Seamless Welding Fittings

TA-5037(P)



20-35 FEET PER MINUTE of light-gauge alloy strip are descaled in this Virgo Descaling Salt bath at 800° F. Photo courtesy of The Drever Company, Philadelphia, Pa.

HOW TO
DESCALE 5½ MILES OF STRIP PER DAY

You can get clean bright surface in ONE operation with VIRGO® DESCALING SALT

Straight chrome and chrome nickel strip flow through this continuous descaling-annealing unit, at 25-35 feet per minute—about 5½ miles per 24 hour day.

The light-gauge strip is descaled in one pass through a bath of molten Virgo Descaling Salt at 800° F., after annealing. The process yields a chemically clean, bright surface with no pitting, etching or metal loss.

Large or small, your plant can show real production-time savings with the Hooker Process using Virgo Descaling Salt, or with the Virgo Molten Cleaner process. Use these processes on stainless and alloy steels; castings; forgings; fabricated parts; material to be salvaged. Both processes are non-electrolytic . . . non-toxic . . . employ simple equipment . . . do not require close supervision . . . are easily adapted to your production methods. For full details, mail coupon or write us today.

For Fast, Safe, Low-Cost DESCALING

VIRGO® DESCALING SALT—Producers and fabricators of stainless and alloy steels use Virgo® Descaling Salt to quickly remove scale produced by hot rolling, forging, extruding, casting, annealing.

VIRGO® MOLTEN CLEANER—Quickly, positively desands and degraphitizes castings; removes grease, dirt, chemicals, paint, enamel, rubber atmospheric corrosion and other impurities.

BOTH HOOKER PROCESSES are backed by 15 years' experience in salt bath descaling and cleaning. Engineering, research and on-site operating assistance are part of our service.

SEND FOR THESE BULLETINS
They tell the whole story on Virgo Descaling Salt and Virgo Molten Cleaner—what they are, how they work, their advantages, equipment involved, and the Hooker services you enjoy as a user of the process.

Hooker Electrochemical Company
33 FORTY-SEVENTH ST., NIAGARA FALLS, N. Y.

Please send me Bulletins checked: Virgo Descaling Salt ☐ Virgo Molten Cleaner ☐

NAME _____

TITLE _____

COMPANY _____

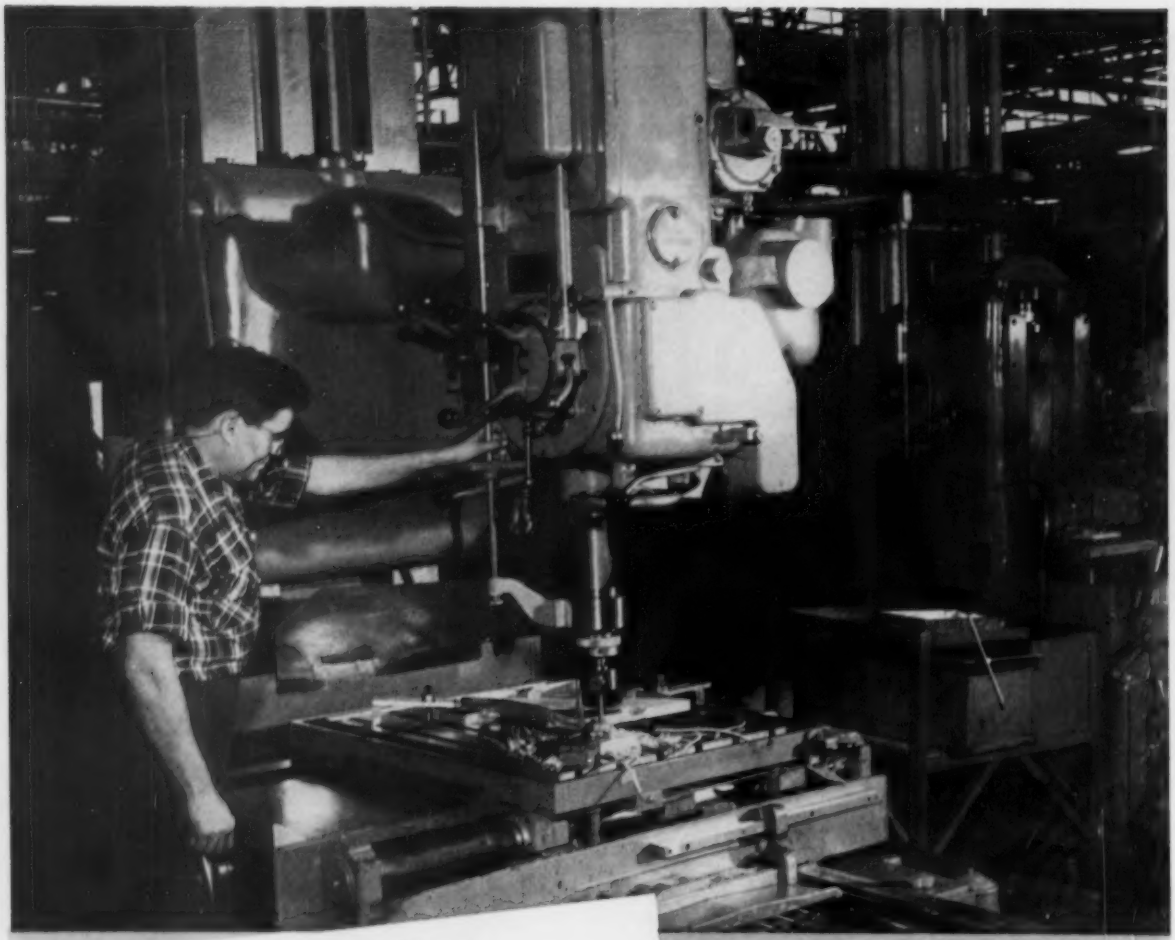
ADDRESS _____

CITY _____ ZONE ____ STATE _____

HOOKER CHEMICALS
1-1445

1905—Half a Century of Chemicals
From the Salt of the Earth—1955

HOOKER ELECTROCHEMICAL COMPANY
33 FORTY-SEVENTH ST., NIAGARA FALLS, N. Y.
NEW YORK, N. Y.
LOS ANGELES, CALIF.
TACOMA, WASH.
CHICAGO, ILL.

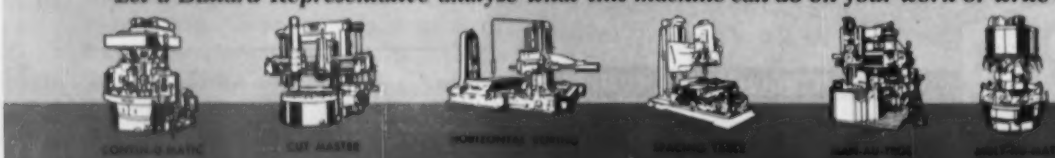


Strategy ... FOR QUALITY

BULLARD

Top Quality in your product demands that interchangeable parts be fabricated to the highest degree of accuracy. To obtain such necessary tolerances requires the selection of machines recognized as meeting such high standards. The Bullard Spacer, without the high cost of jigs or fixtures, gives the San Diego Division of Convair, on drilling and counterboring, tolerances up to +.0015 and —.0000, and distance between hole centers within ±.005. On other installations also, with precision drill spindles, The Bullard Spacer holds consistently to ±.001 or better.

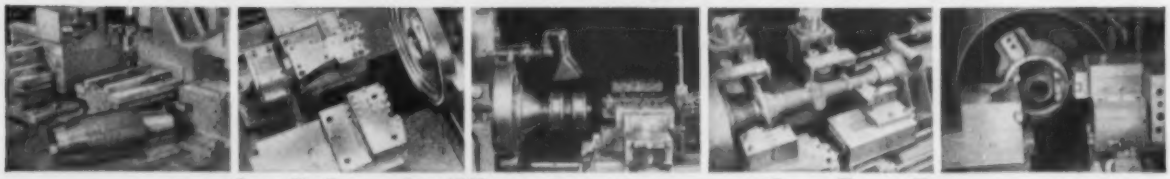
Let a Bullard Representative analyze what this machine can do on your work or write to



THE BULLARD COMPANY · BRIDGEPORT 2, CONN. Tel. EDison 6-2511

All these different tooling setups

show the amazing versatility



# of this fully automatic lathe

...the SIMPLIMATIC

Here's versatility that beats any automatic lathe you ever saw! Actually, the Simplimatic is doing hundreds of jobs like these—jobs that would otherwise be put on *special* machines—built at extra-special cost. But this (and don't miss the important point!) is a *standard machine*—at a *standard price.*

If you have medium or long runs on parts up to 33½" in diameter, get the facts about the Simplimatic Automatic Lathe.

GISHOLT
MACHINE COMPANY
Madison 10, Wisconsin

TURRET LATHES • AUTOMATIC LATHES
SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

THE GISHOLT ROUND TABLE

represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

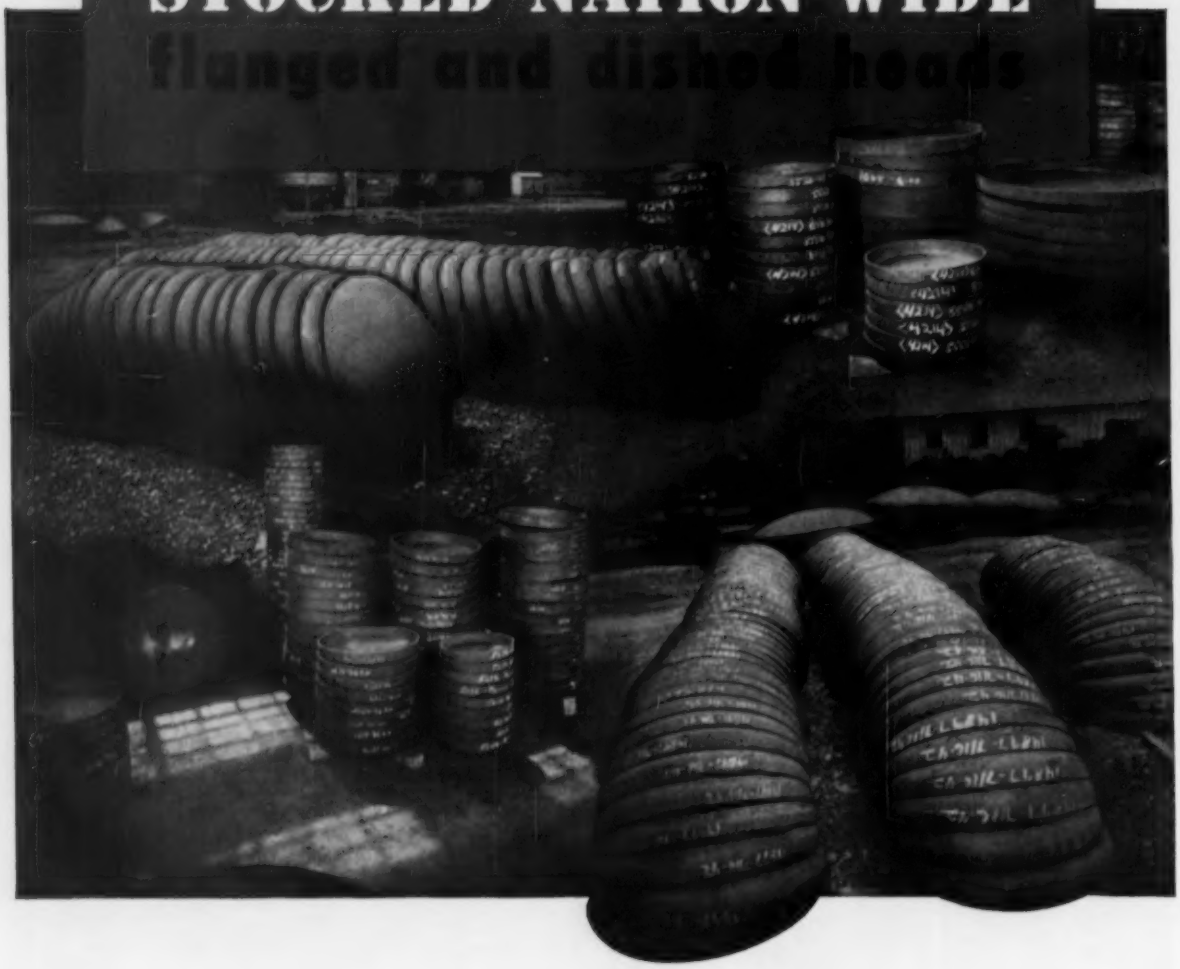
THIS CATALOG may show you how the Simplimatic can save thousands of dollars for you as it is doing for many others. Write for your copy.

Gisholt Machine Co.
Madison 10, Wisconsin
Gentlemen:
Please send my copy of the Simplimatic Catalog.

Name.....*Title*.....
Company.....
Address.....
City.....*Zone*....*State*.....

STOCKED NATION-WIDE

flanged and dished heads



Stocked at CF&I warehouses throughout the country, Claymont Flanged and Dished Heads are always conveniently and promptly available —in standard and ASME types.

Claymont Flanged and Dished Heads are stocked in sizes from 18 inches to 8 feet in overall diameter, and in gauges from 3/16 inch to 5/8 inch. Supplied from carbon steel.

We are also prepared to handle head-forming operations on both ferrous and non-ferrous metal supplied by the customer. To order, contact our nearest sales office or write direct to Wickwire Spencer Steel Division, The Colorado Fuel and Iron Corporation, P. O. Box 1951, Wilmington, Delaware.

Claymont Steel Products

Products of Wickwire Spencer Steel Division • The Colorado Fuel and Iron Corporation

CF&I

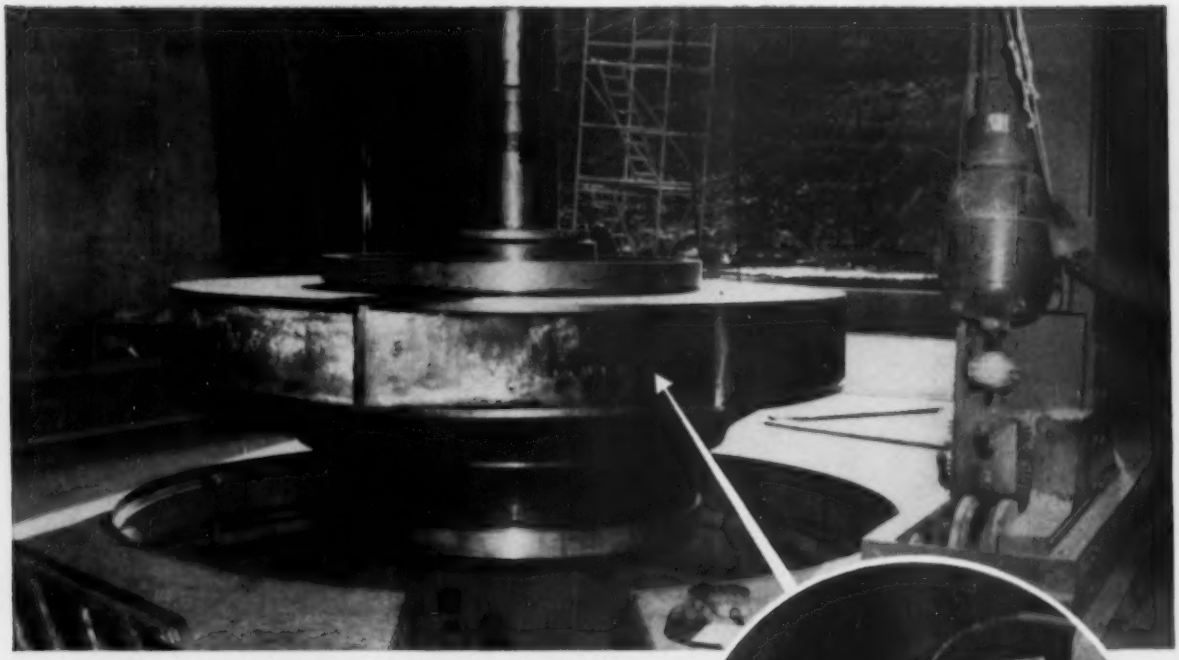
2763

Abilene • Albuquerque • Amarillo • Atlanta • Billings • Boise • Boston • Buffalo • Butte • Casper • Chicago • Denver • Detroit • El Paso • Ft. Worth • Houston • Lincoln (Neb.) • Los Angeles New Orleans • New York • Oakland • Odessa • Oklahoma City • Philadelphia • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • Seattle • Spokane • Tulsa • Wichita

CANADIAN REPRESENTATIVES AT: Edmonton • Toronto • Vancouver • Winnipeg

OTHER CLAYMONT PRODUCTS

Carbon and Alloy Steel Plates • Manhole Fittings and Covers • Stainless-Clad Plates • Large Diameter Welded Steel Pipe • Flame Cut Steel Plate Shapes • CF&I Lectro-Clad Nickel Plated Steel



Sigma welding has made the repair of these large pump impellers faster and more economical. Finished welds are a sound, homogeneous bond.

Sigma Welding Saves $5,000 per unit

Speeds repair of world's second largest pumps . . .

During operation, giant 20 ton manganese bronze pump impellers like this one, suffer cracks ranging in size from small sand inclusions, to cuts over a foot long. By using sigma welding, it is now possible to make high quality, on the spot repairs without disassembling the units — this results in an immediate savings of 5,000 dollars per pump.

Shown above is a typical repair operation on one of the 22,000 hp. electric motor driven pumps. This crack is 11-in. long, 2½-in. wide, and 2-in. deep. The four pegs adjacent to the crack are strain check points. Frequent measurements made of the distance between them determines welding duration and the peening sequence necessary to control distortion which in this operation was less than 0.005 inch. The completed weld made with aluminum bronze wire has an excellent surface appearance and color match.

You can speed production and cut costs in your operations—find out more about sigma welding from your local LINDE representative . . . Start saving now, call him today.

Linde Air Products Company
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
Offices in Other Principal Cities
In Canada: LINDE AIR PRODUCTS COMPANY
Division of Union Carbide Canada Limited, Toronto
(formerly Dominion Oxygen Company)

The term "Linde" is a registered trade-mark of Union Carbide and Carbon Corporation.

Linde
Trade-Mark

Service problems are minimized in the A.B.C. automatic washer by use of Johnson sintered bronze Ledaloyl self-lubricating bearings.

Altorfer Brothers Company assures customer satisfaction by using Johnson Bearings in its A.B.C. Washers

One way that Altorfer Brothers Company, Peoria, Ill., manufacturer of the A.B.C. line of washers, ironers and driers, gets assurance of customer satisfaction is to install the finest bronze bearings available. Altorfer uses powdered bronze bearings made by Johnson Bronze Company of New Castle, Pa., because they are carefully produced to exact specifications and because they retain enough oil to service the bearings during the life of the washer.

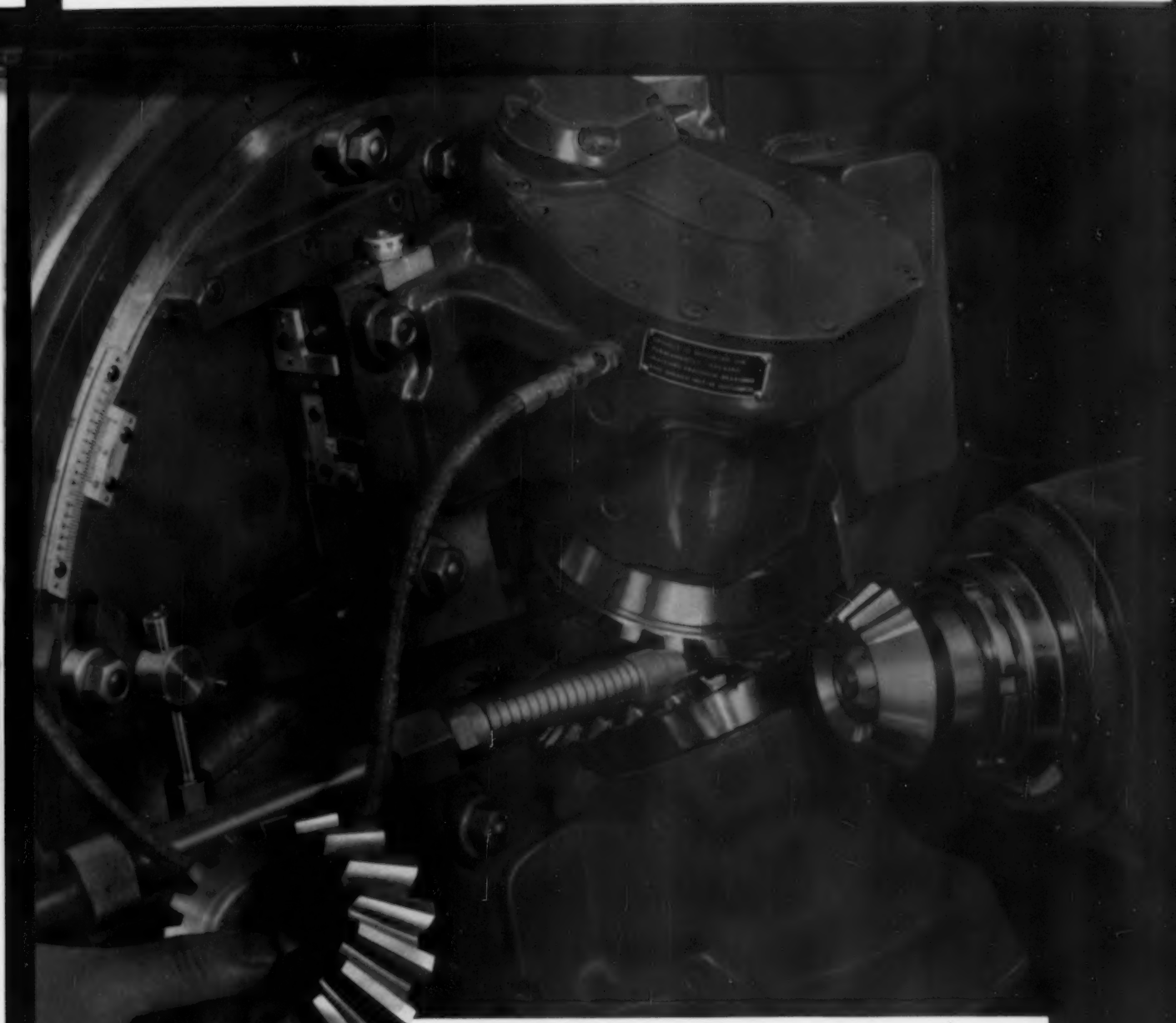
Consider the Ledaloyl sintered bronze bearings which Johnson Bronze makes for use on the A.B.C.-O-Matic washer's shaft and tube. This bearing, one of eight sintered bronze bearings, is the workhorse of the washer and is vital to the operation of the shaft which spins the tub. Johnson Bronze Company has supplied these bearings to Altorfer Brothers since 1950 when the firm first began to make automatic washers.

Altorfer Brothers has used Johnson bearings for other applications since 1928 because of their uniform high quality.

If you have a tough application that calls for long bearing life under rugged conditions, you will want to learn how Johnson Bronze bearings can build more customer satisfaction into your product. If you need it, trained engineering help is available to guide you in choosing the bearings which will lower costs and improve performance. Johnson Bronze Company, 505 South Mill Street, New Castle, Pa.

Johnson Bearings

LEDALOYL *(powder metallurgy)* • BRONZE ON STEEL • ALUMINUM ON STEEL • CAST BRONZE • STEEL AND BABBITT



Gear production 5 times faster with this generator!

• Bevel gears with localized tooth bearing cut from the solid in *one* operation by the new Gleason No. 104 Straight Bevel Coniflex® Generator. Production rates increased 5 to 1. Excellent quality is maintained. Quick set up makes machine ideal for small or large quantity production.

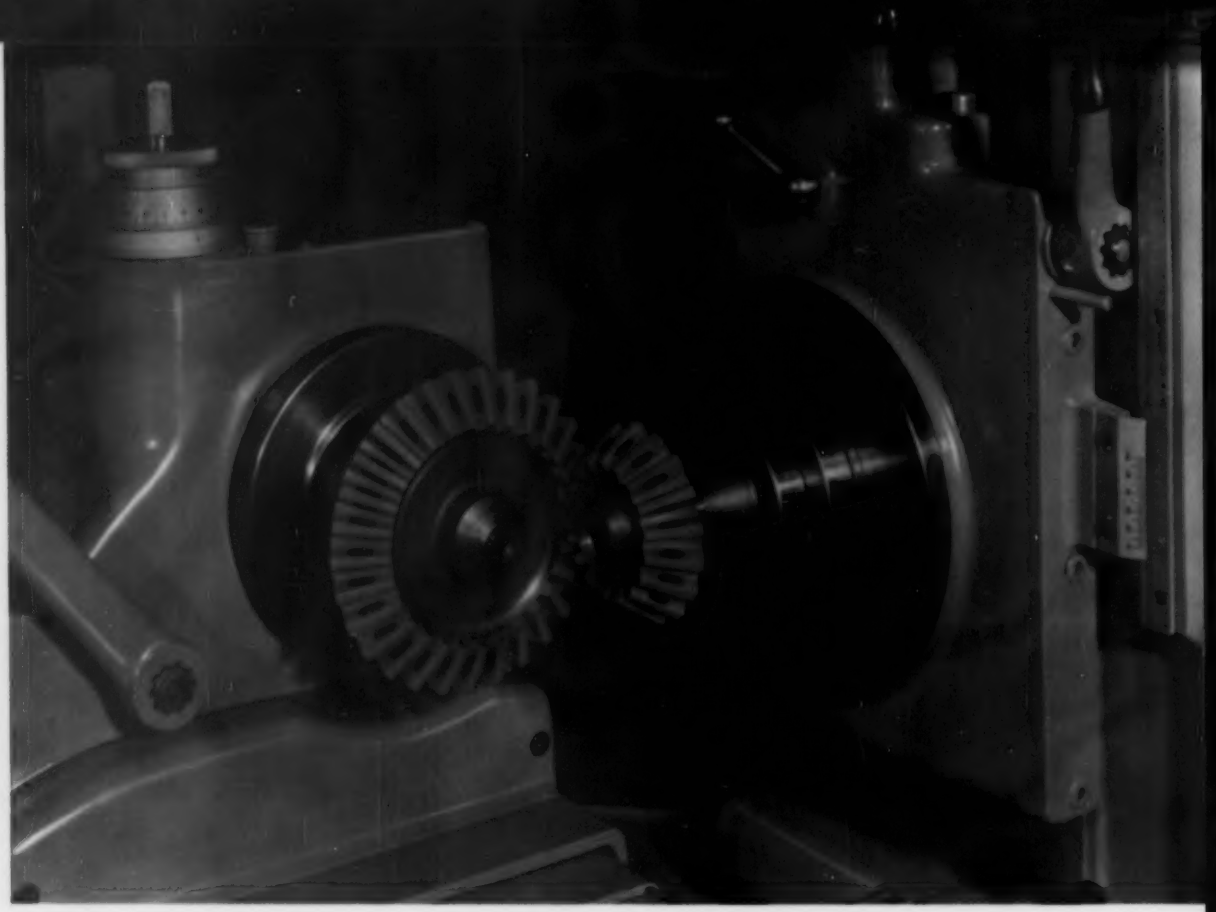
On the reverse side are the tester and sharpener used with the No. 104 Generator. A complete unit of generator, tester and sharpener gives you all of the facilities you require for quality Coniflex gear production.

Write us. We will be pleased to send you bulletins and further information.

GLEASON WORKS

Builders of bevel gear machinery for over 90 years

1000 UNIVERSITY AVE., ROCHESTER 3, N.Y.



Complete your gear production facilities with these auxiliary machines

• In addition to the generator, gear testing and cutter sharpening equipment is absolutely necessary for economical bevel gear production. The No. 13 Universal Gear Tester shown above, and the No. 104 Coniflex® Cutter Sharpener shown left, are the companion machines used with No. 104 Straight Bevel Coniflex Generator on the reverse side of this page.

The No. 13 Tester provides a running test for a wide range of bevel and hypoid gears. Smoothness and quietness of operation, tooth bearing, tooth size, concentricity and tooth spacing errors are all checked by the running test. It simulates actual operating conditions and determines if the gears are correct before final assembly.

Accurate sharpening of the No. 104 Sharpener assures longest cutter life, best finish on gears, and exact duplication of results after cutters are sharpened or replaced.

GLEASON WORKS

Builders of bevel gear machinery for over 90 years

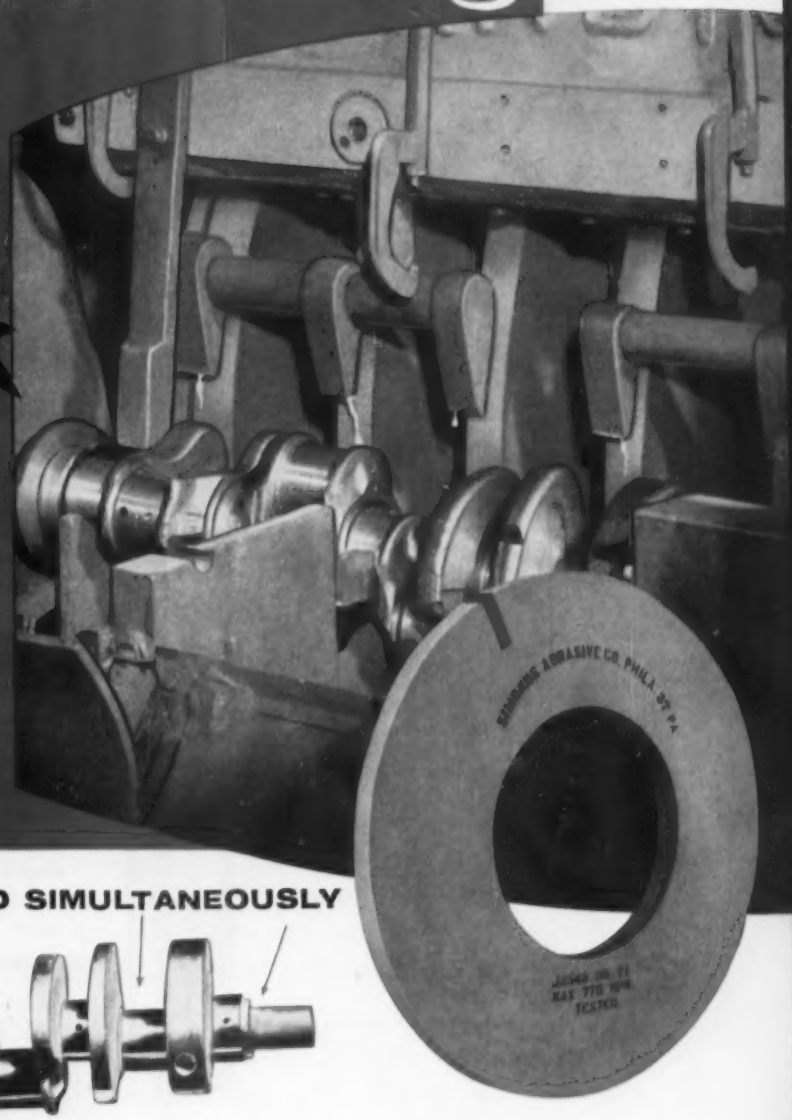
1000 UNIVERSITY AVE., ROCHESTER 3, N.Y.

For Multiple Grinding

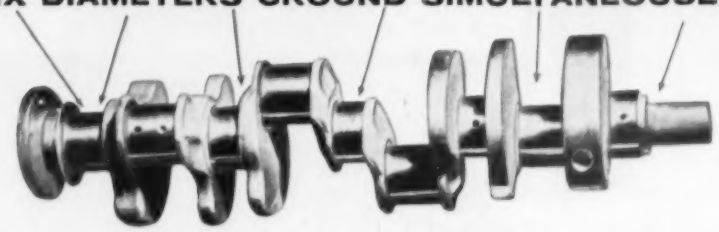
specify

SIMONDS ABRASIVE CO.

grinding wheels in MATCHED SETS



SIX DIAMETERS GROUND SIMULTANEOUSLY



The crankshaft grinding operation illustrated here is typical of the production economies possible with "matched sets" of Simonds Grinding Wheels in multiple set-ups.

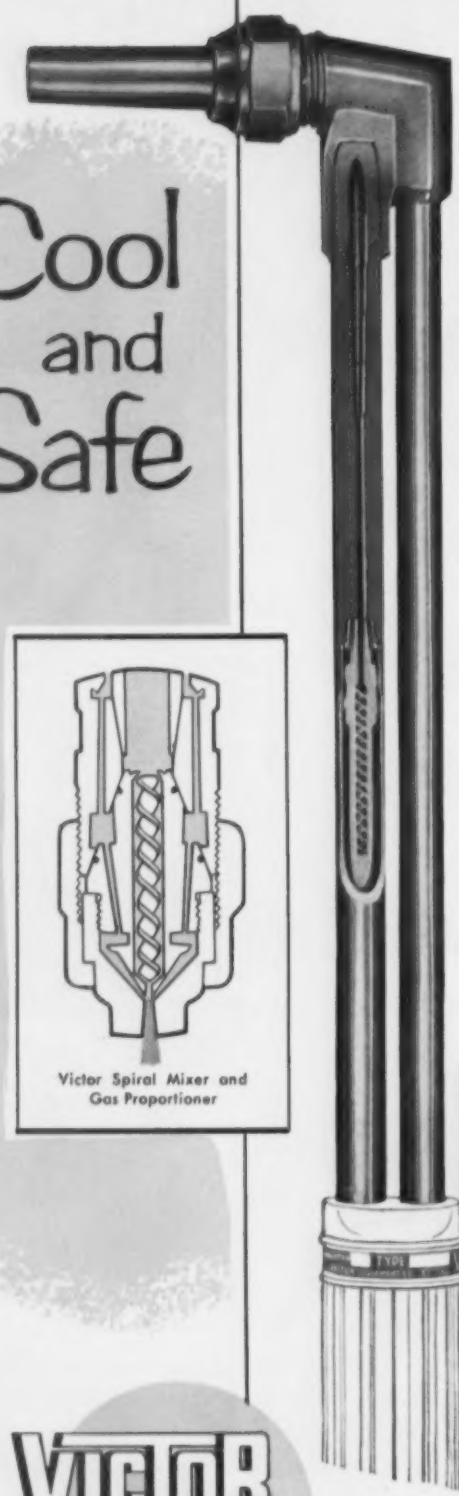
These wheels are furnished in counterbalanced sets, each wheel identified by set number, and painted on the face with a red stripe for accurate line-up on the spindle. Matched for best balance, these sets give more uniform grinding action, better and more production.

If you grind cylindrical parts requiring more than one diameter, investigate multiple wheel set-ups. A Simonds Abrasive Engineer will be glad to help you in determining the specification and recommended procedures for your job. Write for this service today.

SIMONDS ABRASIVE COMPANY • PHILADELPHIA 37, PA.

Branch Warehouses: Boston, Detroit, Chicago, Portland, San Francisco • Distributors in Principal Cities
Division of Simonds Saw and Steel Co., Fitchburg, Mass. • Other Simonds Companies: Simonds Steel Mills, Lockport, N. Y.;
Heller Tool Company, Newcomerstown, O., Simonds Canada Saw Co., Ltd., Montreal, Quebec,
Lion Grinding Wheels Div., Brockville, Ont. and Simonds Canada Abrasive Co., Ltd., Arvida, Quebec

Cool and Safe



Victor Spiral Mixer and Gas Proportioner

on the HOTTEST, TOUGHEST Cutting jobs...

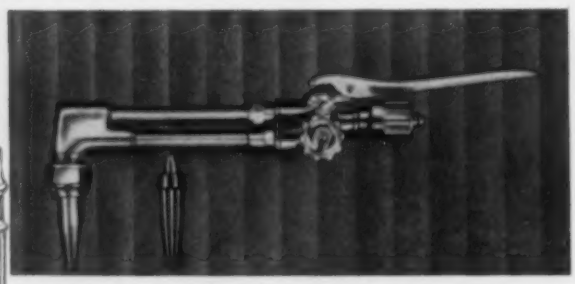
VICTOR

CUTTING TORCHES*

* **With stainless steel head and tube assemblies.**
* **Time-tested spiral mixers**

NOW all Victor torches and cutting attachments have rugged, stainless steel head and tube assemblies, plus time-tested spiral mixers to give you cool, safe cutting on your toughest, hottest cutting jobs. Stainless steel assembly absorbs heat slowly, withstands roughest use, is easier to maintain. Famous Victor spiral gas mixer prevents flashback and back fire, thoroughly mixes gases to make your gas dollars go further. Head and tube assembly is one unit, and can be replaced without buying a complete torch.

Test the Victor cutting torch on your most demanding, severest cutting job. See for yourself how cool it stays, how fast it cuts. Your Victor dealer will gladly demonstrate it. See him *today*.



Cutting attachment, and cut-away of a typical Victor tip, showing carefully proportioned orifices. For best results, always use Victor tips with Victor torches.

VICTOR for welding

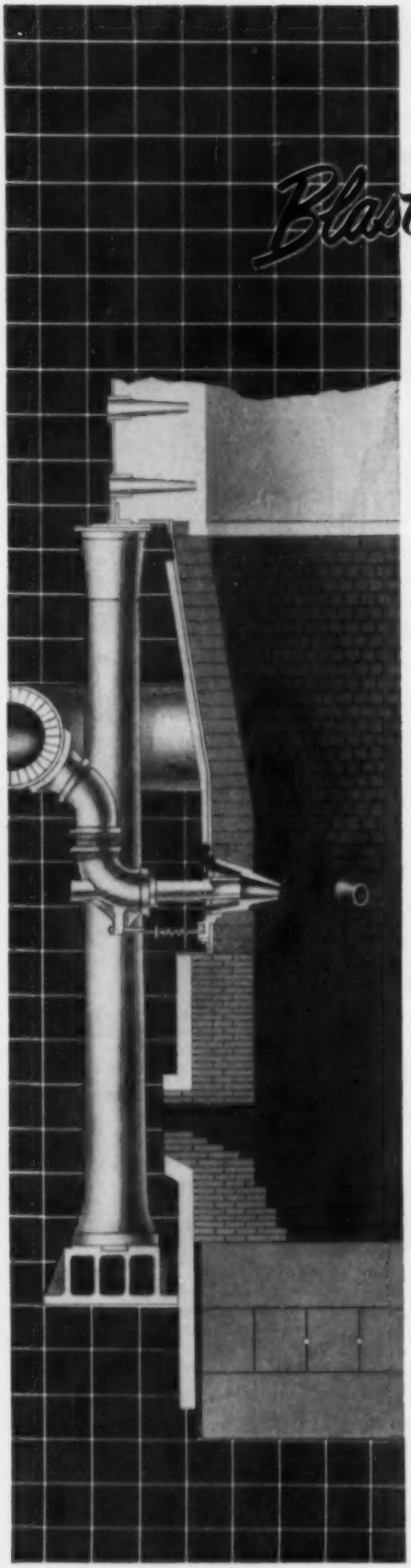
VICTOR EQUIPMENT COMPANY

Mfrs. of welding & cutting equipment; hardfacing rods, blasting nozzles; cobalt & tungsten castings; straightline and shape cutting machines.

25

844 Folsom St.
San Francisco 7

3821 Santa Fe Avenue
Los Angeles 58



Blast Furnace Capacities Increased up to 20%

WITH

NATIONAL
TRADE-MARK

CARBON LININGS

Increases of up to 20 per cent in rated furnace capacity have been achieved when carbon linings were installed up to the mantle — *within the same hearth and under the existing stack shell.* These increases were possible because of the superior refractoriness of carbon, which permits thinner wall constructions with consequent enlargement of inside furnace diameters.

Numerous construction cost analyses have shown initial installation of these "National" Carbon Linings to be more economical because internal cooling is eliminated, which results in much lower maintenance and operating costs.

In addition, "National" Carbon Linings maintain a smooth inner face with freedom from adherence which also helps to improve operating efficiency.

We will be glad to have our representative call at your convenience to supply complete information on "National" Carbon Linings for Blast Furnaces.

The term "National" is a registered trade-mark of Union Carbide and Carbon Corporation

NATIONAL CARBON COMPANY
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street, New York 17, N.Y.

Sales Offices: Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco

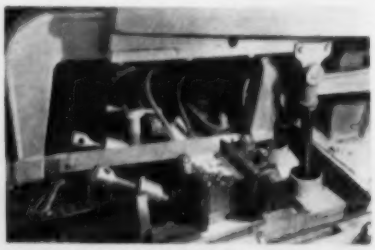
IN CANADA: Union Carbide Canada Limited, Toronto

CIRCULAR SAWS. Simonds makes all three types — Inserted Tooth, Segmental, and Solid Tooth Saws. A "right" saw for every metal cutting application.

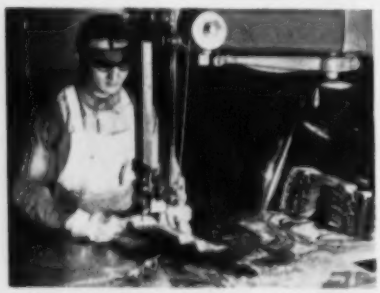
SPEAKING OF NEW CARS

SIMONDS Helps to Reduce the Cost of cars* like this and yours

Few of us could afford new cars like this without the magic of mass production. One of the things that makes mass production possible is the low cost, dependability of Simonds cutting tools and die steels. Simonds quality has long played an important part in the automotive industry. Carefully maintained by 100% quality control from Simonds own Steel Mill through every step of manufacture in Simonds famous "Windowless" plant, Simonds unique quality keeps production lines moving, unit costs down.



HACK SAW BLADES. Simonds "Red End" Hack Saw Blades (Power and Hand) last uniformly longer, cut metal cutting costs.



BAND SAWS. Simonds makes all three types — Regular Tooth, Sabre or Skip Tooth, Spring Temper — to provide the best blade for every application.

FILES. Mechanics report Simonds "Red Tang" Files feel better, file better, last longer — cut more metal per filing dollar. "Prover-tested" for grade A quality.

SQUARING SHEARS. Simonds single edge shear outlasts other types, costs less for shearing thin sheet metal. Made by Simonds exclusive "Tungsweld" method.

DIE STEEL. Simonds 1001 sizes of flat-ground tool and die steel save more time and money in the toolroom — give excellent results on every job.

SIMONDS
SAW AND STEEL CO.
FITCHBURG, MASS.

For Fast Service from Complete Stocks

Call your SIMONDS Industrial Supply DISTRIBUTOR

Factory Branches in Boston, Chicago, San Francisco and Portland, Oregon
Canadian Factory in Montreal, Que.
Simonds Divisions: Simonds Steel Mill, Lockport, N. Y.
Heller Tool Co., Newcomerstown, Ohio
Simonds Abrasive Co., Phila., Pa., and Arvida, Que., Canada

A NEW PLANT

TOLEDO

FOR A NEW 20th Century *persuasive abrasive*

Recently we put our new Toledo, Ohio plant into production. It is specifically designed for you.

From laboratory microscopes to grading screens, every facility of this plant has been selected to furnish you the best metallic abrasive for the lowest possible price.

This modern factory — The Toledo Steel Shot Division — will be devoted to the production of a brand new steel shot, Toledo REALSTEEL — the newest member in our complete line of 20th Century quality shot and grit.

Write for our newest literature.

The CLEVELAND METAL ABRASIVE Co.

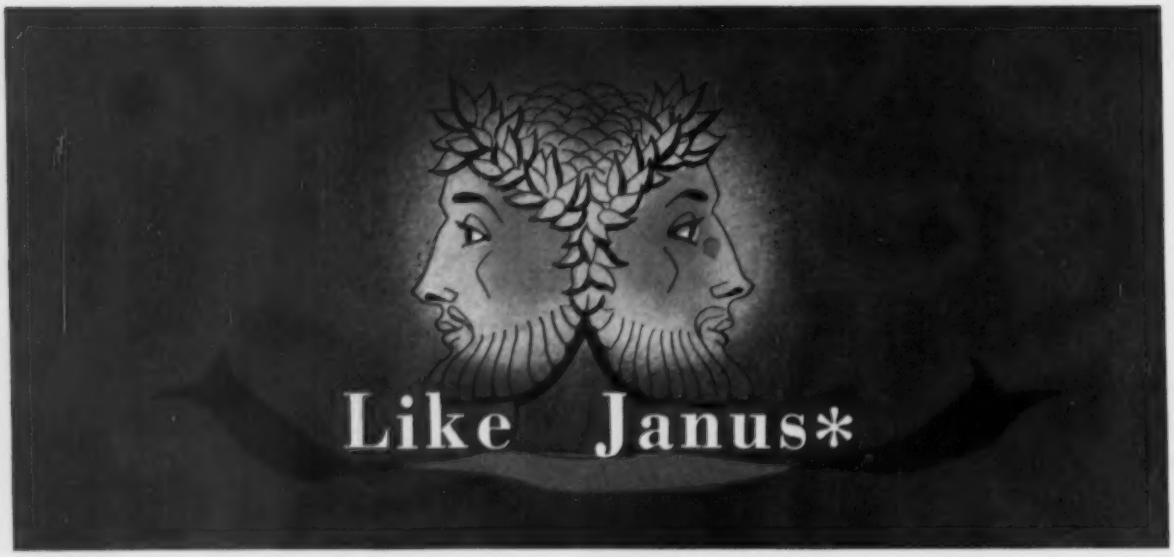
803 East 67th St., Cleveland 8, Ohio

Howell Works: Howell, Michigan

Toledo Steel Shot Division: Toledo, Ohio

One of the world's largest producers of quality shot, grit and powder — Hard Iron — Malleable (*Normalized) — Cut Wire — Cast Steel (Realsteel)

*Copyrighted trade name



Baker's Magdolite

looks back with pride . . . and forward with confidence

Reviewing the past, The J. E. Baker Company is proud of the part it has played in the astounding growth of the steel industry. Since 1889 the JEBCO name has stood for superior products. One of these products, BAKER'S MAGDOLITE the *original* dead-burned dolomite, was the result of continuous research and experimentation to find a far better basic lining for open hearth and electric furnaces. Today as in the past, BAKER'S MAGDOLITE offers increased furnace efficiency at lower refractory costs.

In the future, users of BAKER'S MAGDOLITE can be assured of constantly improved quality and effectiveness, in keeping with the tremendous strides foreseen in increased steel production.

If you haven't done so in the past, be sure to try BAKER'S MAGDOLITE in the near future. You'll discover as others have through the years that the properly burned, grain-sized particles of BAKER'S MAGDOLITE mean more uniform ingots, in greater numbers and with less defective material. Next time specify BAKER'S MAGDOLITE.

JEBCO
PRODUCTS
SINCE 1889

*Janus, the two-faced mythological Roman God of Doors and Gates, could see both what passed behind and before him at the same time.

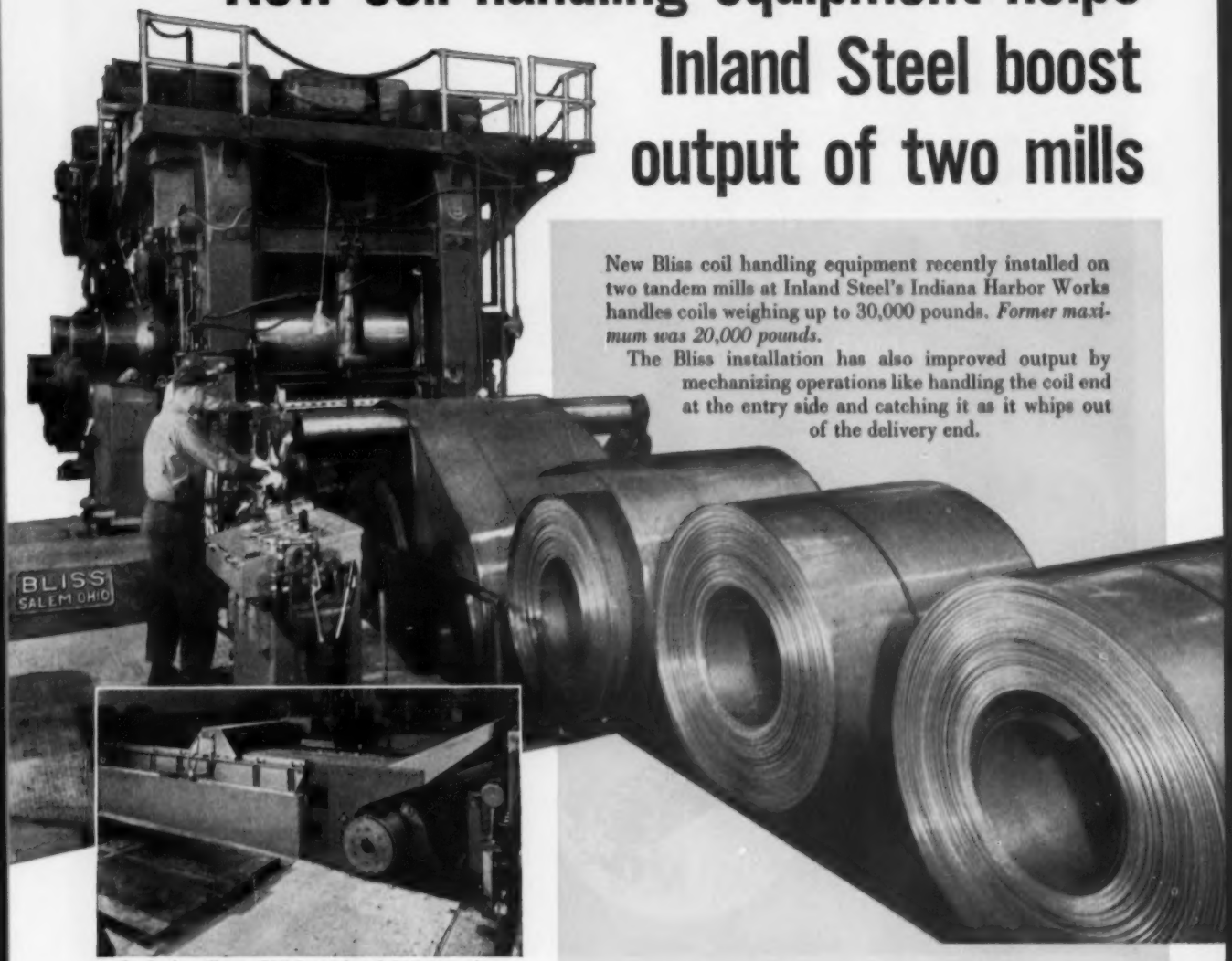
THE J. E. BAKER COMPANY

YORK, PENNSYLVANIA • PLANTS: BILLMEYER, YORK, PENNSYLVANIA • MILLERSVILLE, OHIO

New coil handling equipment helps Inland Steel boost output of two mills

New Bliss coil handling equipment recently installed on two tandem mills at Inland Steel's Indiana Harbor Works handles coils weighing up to 30,000 pounds. *Former maximum was 20,000 pounds.*

The Bliss installation has also improved output by mechanizing operations like handling the coil end at the entry side and catching it as it whips out of the delivery end.



On both mills—a 72" 3-stand and 54" 4-stand—Bliss reel and horizontal belt wrappers like the one above, provide tight, smooth-edged coils.

Bliss entry equipment on 72" mill handles 30,000-lb. coils, mechanically sticking ends.

This mechanization of steps that used to be heavy and hazardous manual labor has meant greater tonnage per man and improved operator safety.

Inland Steel's experience with these two mills shows how safety improvement and production increases can often be coaxed from existing mill equipment simply by improved methods of handling.

It's likely that you too can crack a hidden bottleneck by consulting Bliss. For information on the Bliss line and what it can do for you, write for your free copy of our 60-page Rolling Mill Brochure, Catalog 40-A.

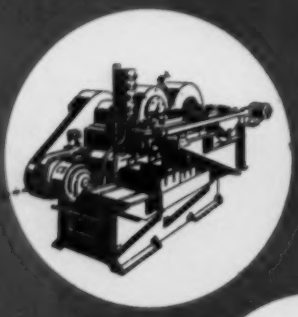
BLISS
SINCE 1857

is more than a name...it's a guarantee

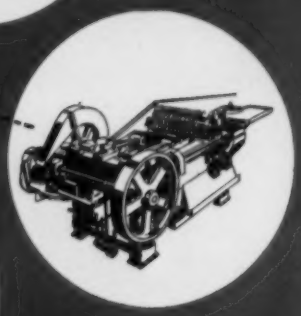
E. W. BLISS Company, Rolling Mill Division: Salem, Ohio

Plants in Canton, Cleveland, Salem and Toledo, Ohio; Detroit and Hastings, Michigan; Midland and Pittsburgh, Pennsylvania; San Jose, California — E. W. Bliss (England) Ltd., Derby — E. W. Bliss Co. (Paris), France

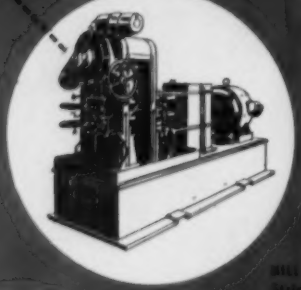
5 KINDS OF WATERBURY FARREL ANSWERS TO YOUR MASS PRODUCTION PROBLEMS



COLD PROCESS BOLT & NUT MACHINERY — Headers (all types) • Rivet Machinery • Trimmers • Thread Rolling Machines • Slotters • Nut Formers and Tappers, etc.

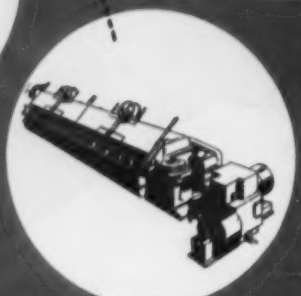


POWER PRESSES — Crank, Cam and Toggle; also Rack and Pinion Presses • Eyelet Machines • Multiple Plunger Presses • Horizontal and Hydraulic Presses, etc.



WIRE MILL MACHINERY — Rolling Mills: Strip, Rod, Wire Flattening, (For Ferrous and Non Ferrous Metals) • Also Slitters • Straighteners • Cut-off Saws • Coilers • Winders, etc.

SPECIAL MACHINERY — Soundproof Mills • Small Arm Ammunition Machines • Collapsible Tube Machines • Coining Mills, etc.



WIRE MILL EQUIPMENT — Continuous Wire Drawing Machines (Upright Cone and Tandem) • Wire Flattening Mills • Chain Draw Benches • Pointers • Swagers • Bull Blocks • String-up • Machines • Annealers, etc.

Within These Basic WF Equipment Lines, Individual Machines Are Custom-Engineered For Specific Applications

If your metal-working machinery problem falls into any of these five groups, there are good reasons for looking to Waterbury Farrel for the answer.

There's Waterbury Farrel's continuing engineering research with more than a century of machine building experience to draw upon. This results in soundly designed and thoroughly tested features which improve production.

There's Waterbury Farrel's world-wide reputation for rugged, long-lasting construction. This gives you the assurance that WF machines are built to provide long years of uninterrupted production.

Waterbury Farrel can custom-engineer special equipment or adapt a standard machine to fit your specific problem.

For further information, write for free booklets on any of the machines mentioned on this page or contact your nearest WF office.

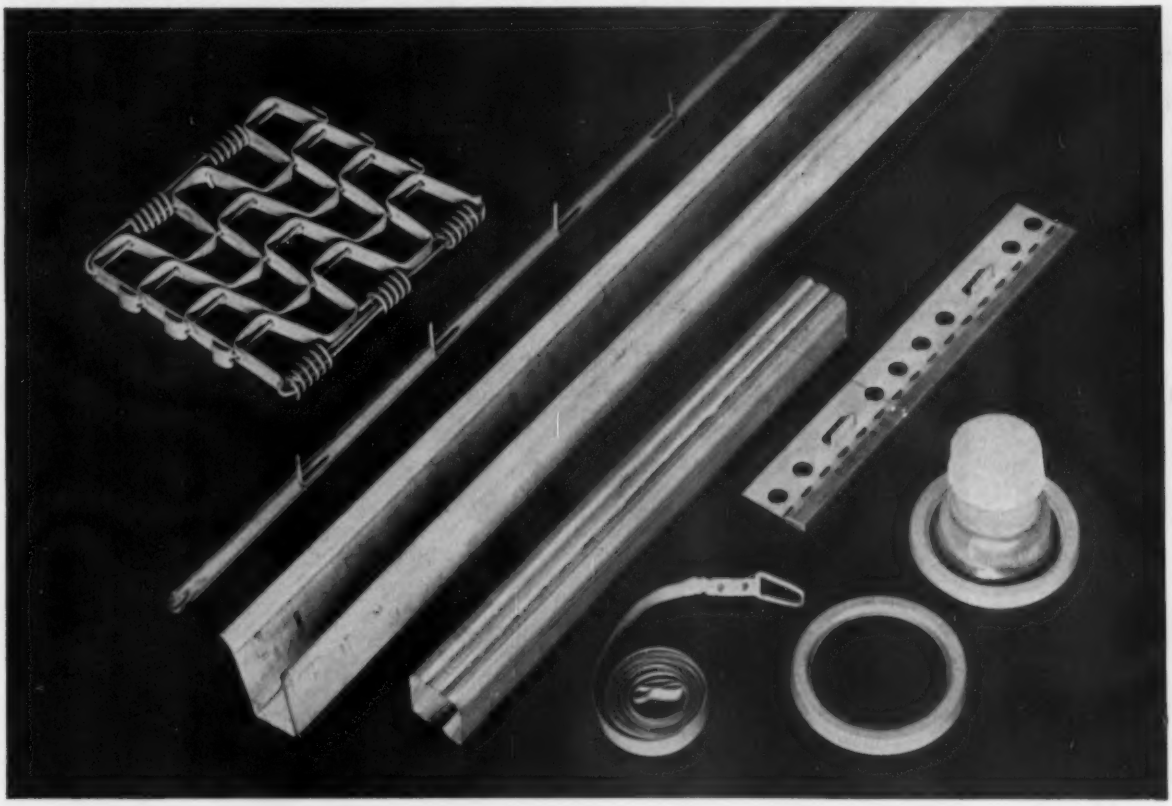
HERE'S A SAMPLE of Waterbury-Farrel mass production equipment in action. This complete WF automatic production unit combines a 40-ton double-acting, upright blanking and cupping press, a conveyor feed and four 7-station horizontal drawing presses to draw 340 zinc shells per minute.

FOUNDED WATERBURY FARREL 1851

WATERBURY FARREL FOUNDRY & MACHINE CO. • WATERBURY, CONN.

Offices: Chicago, Cleveland and Millburn, N. J.

• BRAINARD ELECTRO-GALVANIZED STEEL



How to provide parts with a BUILT-IN PROTECTIVE COATING—at low cost!

Specify Brainard electro-galvanized steel when parts require protection against rust and corrosion . . . you eliminate the coating operation. This pre-coated steel eliminates expensive plating and finishing . . . improves product life and appearance.

The galvanized coating — an integral part of the metal—protects both inside and outside of formed and drawn parts . . . is not affected by forming operations. Coating is hard and uniform, with thickness controlled within .0002.

If your parts require such protection, it will pay you to investigate. Let Brainard quote on your requirements.

Brainard

SHARONSTEEL

STEEL DIVISION
SHARON STEEL CORPORATION

Find out how Brainard's new facilities assure you a dependable source of supply. Send coupon for free booklet.

BRAINARD STEEL DIVISION
Dept. O-10, Griswold Street, Warren, Ohio

Please send free descriptive booklet on Brainard electro-galvanized steel.

Name_____

Position_____

Company_____

Street_____

City_____ State_____

COMPLETE STRAPPING SYSTEMS & MATERIALS • WELDED STEEL TUBING • ELECTRO-GALVANIZED STEEL • SCAFFOLDING • PALLET RACKS • BUILDING PRODUCTS

Offices in principal cities throughout the U. S.

FOUND by these manufacturers THAT

BLISS
E. W. Bliss Company
BOOTH #1414

BRYANT
Bryant Chucking Grinder Company — BOOTH #1015

CMC CLEARING USI
Clearing Machine Corp.
BOOTH #716

CLEVELAND
The Cleveland Automatic Machine Co. — BOOTH #412

CONSOLIDATED MACHINE TOOLS
Consolidated Machine Tool Co. — BOOTH #217

EDLUND
Edlund Machine Co.
BOOTH #115

famco
Famco Machine Company
BOOTH #507

FEDERAL PRESS
Federal Press Company
BOOTH #801

FOSDICK
The Fosdick Machine Tool Co.
BOOTH #1402

FOX
Fox Engineering Company
BOOTH #419

GALLMEYER & LIVINGSTON
Gallmeyer & Livingston Company — BOOTH #905

GREAVES
Greaves Machine Tool Co.
BOOTH #721

speeds installation of any machinery protects accuracy of precision machines

These machine tool builders cut set-up time at the Machine Tool Show from hours to minutes with BARRYMOUNT® Leveling Isolators. No drilling floors, no setting lag bolts, no shimming — they just set their machines on the Barry mounts, adjusted the leveling screws, and the normally tedious, costly job was done.

This is not just a show trick — it's a standard efficiency procedure for new installations and re-installations in large and small plants all over the country. And, *at the show or in your plant*, the isolation built into Barry mounts protects precision machines against vibration from nearby heavy equipment.

At the National Metal Exposition in Philadelphia, you will find Barry Engineers at Booth 2062, ready to show you how you can simplify installation, protect machine accuracy, prolong machine life, and cut maintenance costs with Barry Machine Mounts.

BARRY CONTROLS
INCORPORATED
795 PLEASANT STREET WATERTOWN 72, MASS.
SALES REPRESENTATIVES IN ALL PRINCIPAL CITIES

JOHNSON
Johnston Machine & Press Corp.— BOOTH #411

KINGSBURY
Kingsbury Machine Tool Corp.
BOOTH #915

PRECISION PRODUCTION THROUGH MICROFINISHING
MICRO MATIC
Micromatic Hone Corporation
BOOTH #1211

MOLINE
Moline Tool Company
BOOTH #1304

Monarch
TURNING MACHINES
The Monarch Machine Tool Co.
BOOTH #920

THE MOTCH & MERRYWEATHER MACHINERY CO
The Motch & Merryweather Machinery Co.—BOOTH #606

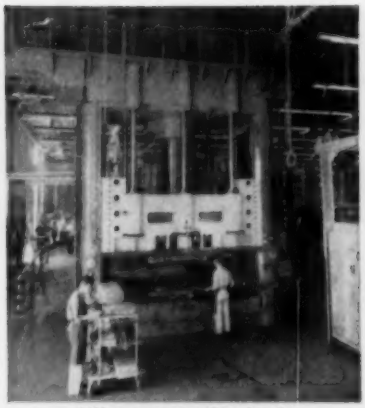
Onsrud
Onsrud Machine Works Inc.
BOOTH #812

RACINE
Racine Hydraulics & Machinery Inc.
BOOTH #102

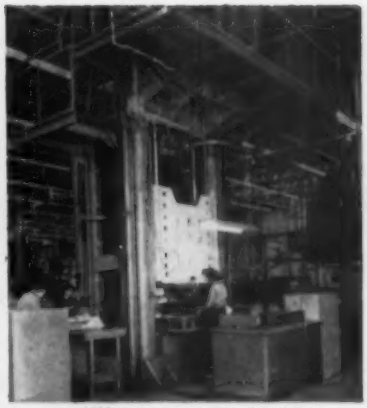
SHEFFIELD
The Sheffield Corporation
BOOTH #1305

Van Norman
Van Norman Company
BOOTH #905

WIEDEMANN
Wiedemann Machine Co.
BOOTH #1420

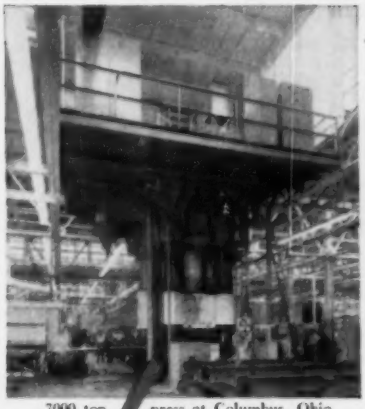


1100 ton press at Los Angeles

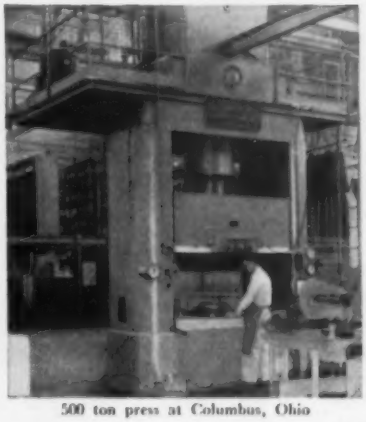


1000 ton press at Los Angeles

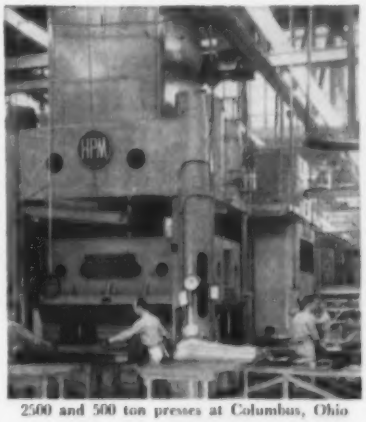
7000 ton press at Los Angeles



7000 ton press at Columbus, Ohio

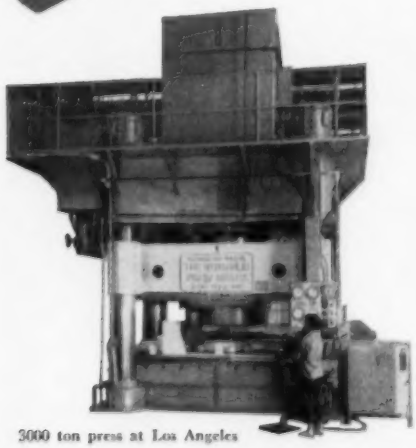


500 ton press at Columbus, Ohio



2500 and 500 ton presses at Columbus, Ohio

Look AT THE H-P-Ms at North American Aviation, Inc.



3000 ton press at Los Angeles

There's $2,000,000 invested in H-P-M presses at North American plants. And, they're a good investment! Why? Because big hydraulic press power, dependability and versatility are major factors in high production output in the aviation industry. These presses are being used for high-pressure rubber pad forming, die quenching, deep drawing, piercing and blanking . . . jobs where versatility must be "built-in", instantly adaptable to varying requirements and countless operations.

Yes, North American is just one of the airframe manufacturers depending on H-P-M presses to keep their production lines humming. For real unit cost reduction, plan your operation around H-P-Ms. Write for details or call in an H-P-M engineer, today.

THE HYDRAULIC PRESS MFG. COMPANY

MOUNT GILEAD, OHIO, U. S. A.

HPM

AIRengineering at work
REPORT No. 4150.25

Cuts 60 Second Metal Drilling Job to 15 Seconds . . . with Air Punching Tool

A sub-contractor for a large auto manufacturer formerly used two men, an electric drill and a drilling jig to drill two ¼" holes in rear auto fenders.

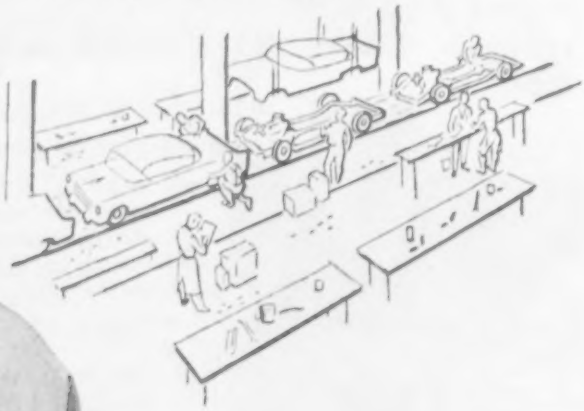
This method required a whole minute and failed to provide uniform results. In addition, paint damage and broken drills caused excess time loss.

AIRengineering by Ingersoll-Rand solved the problem fast. A size AR130 Air Buck Riveter was equipped with special yoke, punches and stripping mechanisms. The holes are now punched four times faster, with closer tolerances and only *one* man is required instead of two.

If you are in a position to encourage cost-savings in your plant, you should see I-R's confidential manual reports on "AIRengineering at Work". Write on your company letterhead and we'll arrange for you to see it soon.

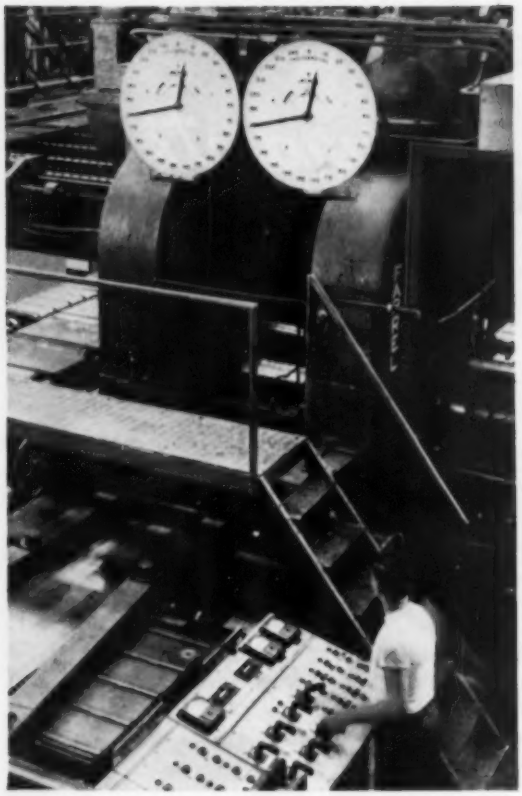
AIRengineering Manual
Over 100 interesting and helpful case history applications of AIRengineering at work.

Ingersoll-Rand
11 Broadway, New York 4, N.Y.



Air Buck Riveter
Punching two ¼" holes in rear auto fender.

B-257



This 30" x 36" two-high, cold brass, breakdown mill is the largest ever designed for the nonferrous metals industry. Handles 3000 lb. bars, 25½" wide, 3" thick, and 120" long. Seven passes reduce these bars to flat metal .540" thick and 62 feet long.

NEED A ROLLING MILL FOR *SPECIALIZED PRODUCTION?*

Each mill on this page is an efficient, economical solution to a specific production problem. Each benefits from nearly 100 years of manufacturing experience and a progression of job-tested design improvements.

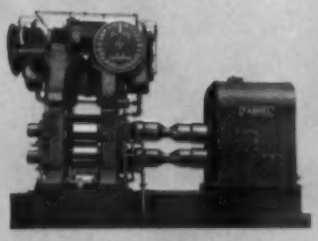
A Farrel® mill built to your exact needs could be equally beneficial. Just give us your requirements and one of our engineers will be glad to discuss your problems with you.

Farrel mills come in a wide range of types and sizes for rolling nonferrous rods, strips or sheets, metal foils and cold strip steel.

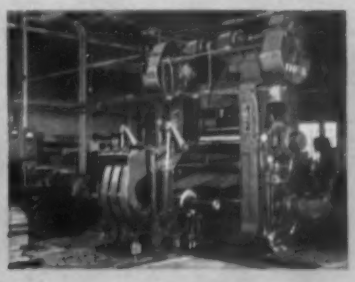
Send for 36-page bulletin, which describes in detail Farrel's broad line of rolling mills, gear drives, pinion stands, and special handling equipment.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

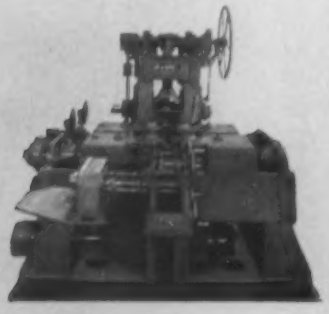
Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Akron, Pittsburgh, Chicago, Fayetteville (N.C.), Los Angeles, Houston



10" x 10" mill specially designed for close gauge control in continuous, high-speed, cold-rolling of high-carbon strip steel. High-powered screwdown permits gauge adjustment under full load.



Designed specifically for increasing aluminum foil production, this mill has 9" x 46" work rolls and 21" backup rolls. Speed of operation can be varied to meet production requirements.



22" mill for cold-rolling commutator bars. Straightener and roll edger designed into assembly so bars of commonly used size can be straightened, edged and cold-rolled in one continuous operation under precise dimensional control.

FARREL® ROLLING MILL MACHINERY

Rolls • Rolling Mills • Rod Mill Tables and Manipulating Equipment • Universal Mill Spindles • Rod Coilers • Gears • Mill Pinions • Pinion Stands • Gear Drives of Any Capacity • Flexible Couplings • Roll Grinding Machines • Roll Calipers

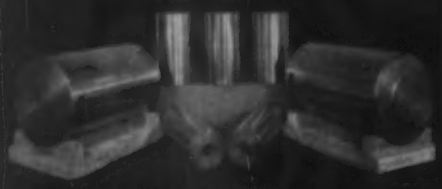
Farrel-Birmingham ®

FB-1025

THE RED CIRCLE is your Guarantee!

RED CIRCLE Rolls ALLOY-CHILLED

18" 3 Hi Bar Mill



Chilled Iron Hydraulic Rams

Hyde Park Red Circle Rolls are known by the red circle on the end of the roll—it is the mark of quality.

For over fifty years Hyde Park Red Circle Rolls have been giving top production and achieving new endurance records in many mills throughout the country.

A Red Circle Roll for every purpose.

Chilled Rolls • Alloy Iron Rolls • Moly Rolls • Nickel Chilled Rolls • Grain Rolls • Cold Rolls • Sand Rolls Chilled Hydraulic Rams

Rolling Mill Equipment

Hyde Park Rolling Mill Equipment is extra rugged to withstand the increasing demands of production. Our engineers will be glad to co-operate with you regarding any special mill equipment.

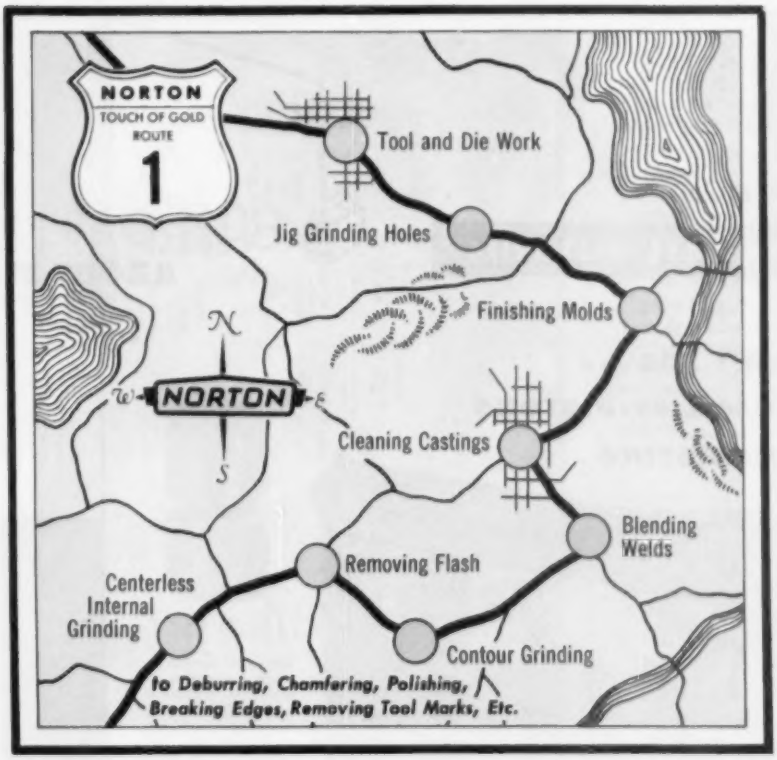
Bar Mills • Merchant Mills • Sheet and Strip Mills • Pinion Stands • Roller Tables • Reduction Drives • Stretcher Levellers • Guillotine Shears • Sheet Mill Shears • Roll Lathes • Special Machinery • Machine Work

Gray Iron Castings up to 80,000 lbs.

Floor Plate

Hyde Park FOUNDRY & MACHINE CO.

HYDE PARK, WESTMORELAND COUNTY, PITTSBURGH DISTRICT, PA.



NEW THRU-WAY OPEN!

NORTON MOUNTED WHEELS AND POINTS

chart your "TOUCH of GOLD" Route to hard-to-reach grinding spots

You by-pass trouble, save time and costs, when you use Norton mounted wheels and points to reach those hard-to-get-at grinding areas. That's because Norton builds into every one of them the same "Touch of Gold" performance that you get with all Norton wheels.

They're trued on their own spindles. This not only gives them perfect concentricity plus accuracy of dimensions and shape. It also assures sharpness and fast-cutting action from the start — no breaking-in needed.

They stay TIGHT on their spindles under toughest use — thanks to Norton-developed mounting techniques.

They're identically duplicated. Norton's statistical quality control makes sure you'll get top performance with every re-order.

The line of Norton mounted wheels and points is 100% complete, covering all applications. Available in all required abrasive and bond types, including diamond abrasives and laminated BF construction. Special spindles and cement available for ultra-high speed precision grinding.

See your Norton Distributor or write to NORTON COMPANY, Worcester 6, Mass. Distributors in all industrial areas, listed under "Grinding Wheels" in your phone directory, yellow pages. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Massachusetts.

W-1650

NORTON

Making better products... to make your products better

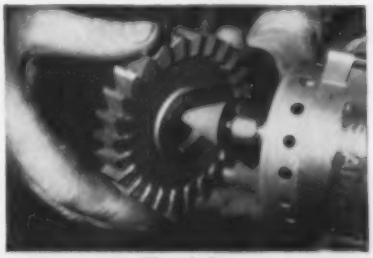
and its BEHR-MANNING division

NORTON COMPANY: Abrasives • Grinding Wheels • Grinding Machines • Refractories
BEHR-MANNING DIVISION: Coated Abrasives • Sharpening Stones • Pressure Sensitive Tapes

Finishing a die

Centerless internal grinding

Smoothing a mold


Chamfering

Cleaning a casting

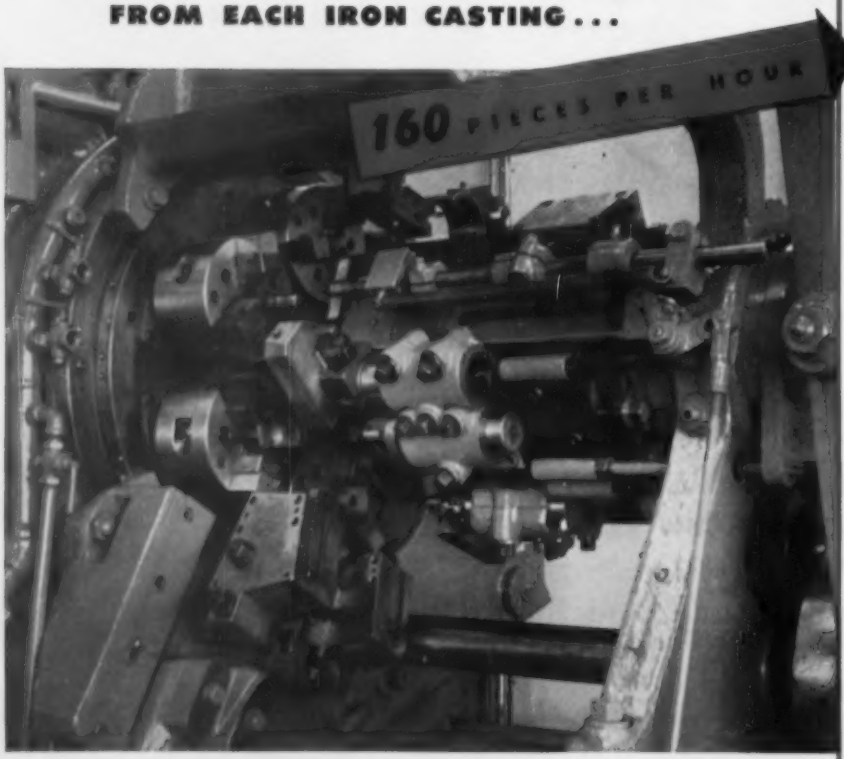
Deburring a slot

4th in a Series...

OF HIGH PRODUCTION CASE HISTORIES

ASK BAIRD ABOUT IT

"TURN-AROUND" JOB... PRODUCES 2 HYDRAULIC LIFT PISTONS FROM EACH IRON CASTING...



FIRST PASS:

Work is placed in chuck equipped to receive the unfinished casting. Outer end is then rough-and-finish turned an OD (allowing for grinding); ends are faced; spherical seat rough-and-finish turned; centering seat chamfered and turned, and shoulder diameter turned concentric with OD. Groove cut concentric with OD.

SECOND PASS:

Work is turned around after return to loading station and placed in adjacent chuck, unfinished end out, and passed through machine for the same operations. The parts are then separated.

TOOLING: This Baird 76H Chucking Machine is arranged for single indexing with alternate chucks for rough-and-finished ends of the work, two-station live-center attachment, adjustable tool holder for use in machining three different sizes of pistons, and with alternate cycle cut-off.

If your production could benefit by up-to-the-minute, cost-saving "automation" tooling like this . . . "Ask Baird About It."

Write Dept. IA

THE BAIRD MACHINE COMPANY

STRATFORD CONNECTICUT

WHERE YOU WILL GET THE HELP OF SPECIALISTS ON THESE ESSENTIAL PRODUCTION PROBLEMS:

AUTOMATIC MACHINE TOOLS • AUTOMATIC WIRE & RIBBON METAL FORMING MACHINES • AUTOMATIC PRESSES • TUMBLING BARRELS

BBA 65

Looking for a special "character" in Spring Steel, to improve your product?

Check with Sandvik

Wherever spring steel *performance* is vital, it pays to look into the "character" of the steel you specify. By "character" we mean the inherent quality of the material which enables it to meet tough physical demands.

Sandvik Swedish strip steels have a special "aptitude" for tough applications. (For example, take a look at the partial list below). The extraordinary "character" of Sandvik steel results from a basic purity of raw materials, plus specialized methods and close control maintained throughout processing. This assures consistent, successful performance coil after coil, lot to lot.

Sandvik cold rolled high carbon strip steel is available:

- **In special analyses for specific applications.**
- **Precision-rolled in thicknesses to fit your requirements.**
- **In straight carbon and alloy grades.**
- **Annealed, unannealed or hardened and tempered.**
- **Polished bright, yellow or blue.**
- **With square, round or dressed edges.**
- **Wide range of sizes in stock—also slitting facilities available.**

SANDVIK Swedish Specialty Strip Steels are used for Textile Machine Parts such as sinkers, needles, etc. • Band Saws (metal, wood and butcher) • Camera Shutters • Clock and Watch Springs • Compressor Valves • Doctor Blades • Feeler Gauges • Knives such as cigarette knives, surgical instruments, etc. • Razor Blades • Reeds • Shock Absorbers • A Wide Variety of Springs • Trowels • Vibrator Reeds • Piston Ring Segment and Expanders, etc.

Sandvik also supplies high quality Swedish Magnet Iron Strip and Wire for specialized electrical purposes such as direct current relays, electromagnetic brakes, couplings, chucks etc.

Ask your nearest Sandvik office for further information or technical assistance

SANDVIK STEEL, INC., 1702 NEVINS ROAD, FAIR LAWN, NEW JERSEY

Looking back, the first half century of the American Cast Iron Pipe Company has been one of growth and progress . . . from a small shop to one of the world's major producers of high quality centrifugally spun cast iron pipe and steel tubes.

Today, ACIPCO products are serving industry on every continent of the globe . . . as well as in the air and on the surface of the seven seas.

In ships, planes and rockets, ACIPCO steel products are strengthening the defense of our nation and helping to preserve the American way of life. ACIPCO's centrifugally spun steel and cast iron tubes as well as cast iron pressure pipe are serving the paper, chemical, petroleum, textile and numerous other industries.

But we at ACIPCO prefer to measure the products of our hands and minds in terms of service to people. We like to feel that our iron and steel products are playing an important role in the 20th Century scheme of things.

Having grown with the big job that it does, ACIPCO now looks to the next 50 years! . . .

50th ANNIVERSARY

ACIPCO

1905 1955

Join us at the National ASM Metal Exposition and Congress
Oct. 17-21 — Convention Hall, Philadelphia — BOOTH 1830

AMERICAN
CAST IRON PIPE CO.
Special Products Division
BIRMINGHAM 2, ALABAMA

DISTRIBUTORS

Austin-Hastings Co., Inc.
226 Binney St.
Cambridge 42, Mass.

J. M. Tull Metal & Supply Co.
285 Marietta St., N.W.
Atlanta, Ga.

Peter A. Frasse and Co., Inc.
17 Grand St.
New York 13, N. Y.

C. A. Roberts Company
2401 Twenty-fifth Avenue
Franklin Park, Ill.

Lyman Tube & Bearings, Ltd.
920 Ste. Sophie Lane
Montreal 3, Canada

Ducommun Metals & Supply Co.
4890 So. Alameda St.
Los Angeles 54, Calif.

Strong, Carlisle & Hammond Co.
1392 W. Third St.
Cleveland 13, Ohio

A Completely New Machine—

designed especially for

BORING AND MILLING SMALL PIECES

for PRODUCTION WORK or ONE-PIECE JOBS

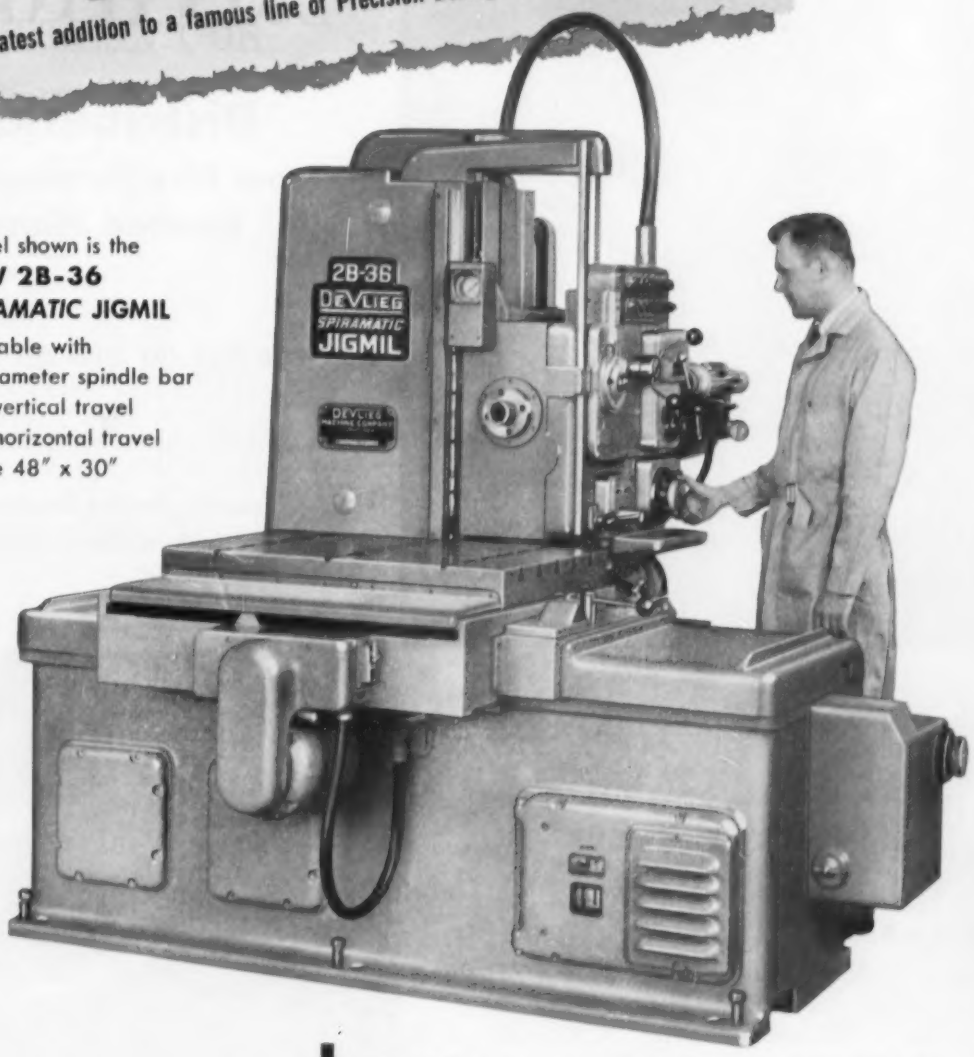
•

The MODEL 2B-36

DE VLIEG *SPIRAMATIC* JIGMIL

latest addition to a famous line of Precision Boring and Milling Machines

Model shown is the
NEW 2B-36
***SPIRAMATIC* JIGMIL**
available with
3″ diameter spindle bar
36″ vertical travel
48″ horizontal travel
Table 48″ x 30″



WRITE FOR ILLUSTRATED CATALOG

DE VLIEG MACHINE COMPANY
450 Fair Ave., Ferndale • Detroit 20, Michigan

This new Erie Furnace is part of a program of plant expansion.

With greatly increased productive capacity, we are serving industrial America from five favorably located plants in Erie, Toledo, Chicago, Duluth.

PICKANDS MATHER & COMPANY

Union Commerce Building • Cleveland 14, Ohio

Chicago • Cincinnati • Detroit • Duluth
Erie • Greensboro • St. Louis • Washington

IRON ORE • PIG IRON • COAL • COKE
FERROALLOYS

PM

MELTRITE
PIG IRON

Distribution
From Five Strategically Located Plants

■

MORE USED THAN ANY OTHER MERCHANT PIG IRON

■

Foundry Service Department available without obligation

AUTOMATION

AND
AUTOINSPECTION
SYSTEMS, CIRCUITS
AND CONTROLS
HAVE BEEN OUR
BUSINESS FOR
MORE THAN A
DECADE. IT
WILL PAY YOU
TO CHECK YOUR NEEDS
AGAINST SHEFFIELD
EXPERIENCE

WRITE DIV. 510 FOR BULLETIN NO. AU-1154

THE SHEFFIELD CORPORATION
DAYTON 1, OHIO, U.S.A.

SHEFFIELD — MASTER CRAFTSMEN HEADQUARTERS

SHEFFIELD

MANUFACTURE AND MEASUREMENT FOR MANKIND

7153

1. Gaging cylinder bores for selective assembly
2. Controlled honing of gear blank bores
3. Automatic gage for 100% inspection of small arms ammunition
4. Connecting rod inspection
5. Controlling the grinding of ball bearing races
6. Post-process size control of bearing races
7. In-line inspection of automobile part
8. Controlling 12 grinding machines
9. Controlling bore size of pinion blanks
10. Automatic gaging of crankshaft main bearings

THE FINAL RETURN YOU GET ON ANY MACHINE YOU BOUGHT AT THE SHOW WILL BE DETERMINED BY A LITTLE TOOL LIKE THIS

You looked at many machines at the Machine Tool Builders Show. They were the most modern that man's ingenuity has been able to design and build . . . with higher powers, feeds, speeds . . . greater versatility. Perhaps you bought one . . . or more than one. Or perhaps you deferred your purchase to a later date. But, in either case, remember this: the *final* return on any machine depends on a little tool.

It will pay you to give your machines the tools they deserve . . . the BEST — whether the machine is one of the latest, high velocity automation types or an older one now in your plant.

For the latest developments in tool design and cutting grades . . . tooling for *consistent top* performance on any type of operation, or on any machine . . . look to Kennametal* for the best; because Kennametal has led the industry for years in improving tools and tooling techniques.

So, to be assured of the best . . . tooling to give the most consistent *repeat* performance, lowest cost per cutting edge and tools proved BEST — TEST AFTER TEST, specify Kennametal by *grade* and by *toolholder*.

Let a Kennametal Tool Engineer show you reports of performances with Kennametal tooling. He will be glad to help you select the right grade and tool for each operation. KENNAMETAL INC., Latrobe, Pa.

*Registered Trademark 7196

The NEW KENDEX

(illustrated above)

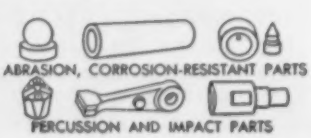
. . . combines simple but sturdy construction and the capacity to take deep cuts over a wide range of operations with inexpensive, turn-over type "throwaway" inserts. The clamp lifts for quick, accurate indexing, and is so designed that clamp forces are in the same direction as the cutting forces. Chipbreaker and shim of Kennametal, for long life, reduced machining costs. *Available immediately from stock in 17 styles and sizes.*

The NEW Kennametal Grade K-21

is outperforming all other carbides in the General Purpose Steel-cutting group because of its high edge strength combined with superior wear qualities and resistance to cratering. *Available in all insert styles from stock.*

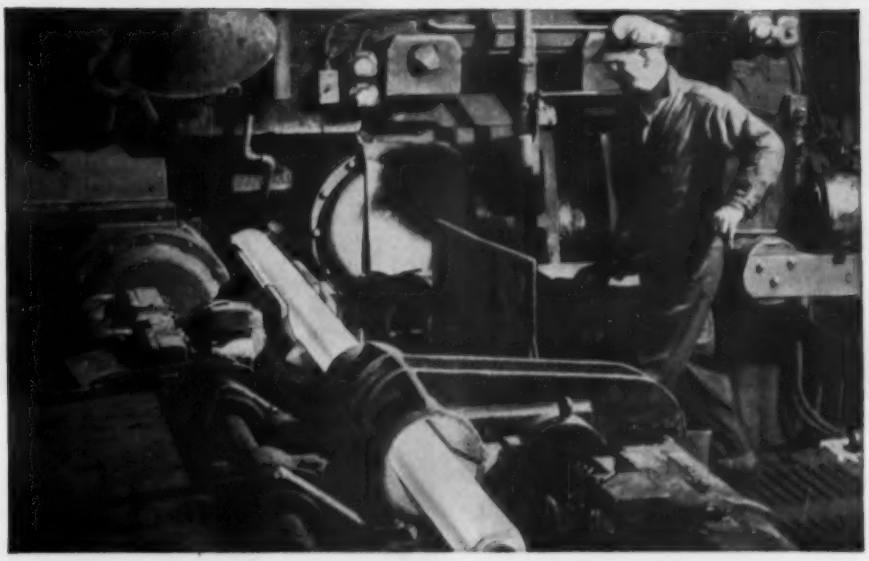
Give your machines the tools they deserve . . . the BEST

INDUSTRY AND **KENNAMETAL** *...Partners in Progress*



use 'dag' dry films for trouble free lubrication

dag DISPERSIONS®



How to extend productive life of piercers, punches, dies

Lubricate these tools with **'dag'** Colloidal Graphite . . . the resultant non-galling *dry lubricating film* easily bears the heat and pressure of these rigorous operations.

As cooling-water is sprayed on the tools between strokes, a graphoid coating protects them against the corrosion which normally attacks hot, wet, steel surfaces. The graphite treatment also reduces shearing friction, producing smoother finishes to closer tolerances so that subsequent machining operations are frequently unnecessary.

'dag' dispersions are also used profitably in forging, stamping, deep-drawing, casting, stretch-forming and wire drawing, for which conventional lubricants are inadequate. There are a surprising number of ways in which **'dag'** Colloidal Graphite can be used in your metalworking operation. Write for our free booklet containing typical applications, Bulletin No. 426-Q2.

ACHESON COLLOIDS COMPANY
PORT HURON, MICHIGAN
...also ACHESON COLLOIDS LIMITED, LONDON, ENGLAND

With magnet hook or bucket... BROWNHOIST speeds the job

Brownhoist Cranes are helping maintain high production schedules in mines, steel mills, factories, and scrap yards . . . in fact, wherever there are railroads throughout the world. Brownhoist Diesel-Electric Locomotive-Cranes, for all their husky size, handle easily. Their patented Monitor Type Cab and Clear-Vision Boom give a 360° view. Operating controls are within easy reach. Electric travel permits operation as a switch engine as well as a crane. Constructed to last for many years with little maintenance. Brownhoist Diesel-Electric Cranes are available in capacities from 25 to 100 tons. For complete information, consult your nearest Brownhoist representative or write us today.

181

BROWNHOIST

BROWNHOIST MATERIALS HANDLING EQUIPMENT GIVES A LIFT TO AMERICAN INDUSTRY

SUBSIDIARY OF Penn-Texas

INDUSTRIAL BROWNHOIST CORPORATION
BAY CITY, MICHIGAN DISTRICT OFFICES: New York, Washington, Pittsburgh, Cleveland, Chicago, Denver, San Francisco, Montreal • AGENCIES: Detroit, Birmingham, Houston

Eaton-Reliance

SPRINGTITES® & SEMS

Reduce Production

Problems.... *Right Now!*

If you use bolts and lock washers for fastening assemblies . . . here's a suggestion for saving time and money. Substitute Reliance Springtites and Sems. It is possible to reduce manual fastening time by ½ and multiply efficiency by 2.

The reason for this saving lies in the one piece design of these Reliance fasteners. By making the lock washer an integral part of the bolt, yet free to rotate and function, production workers eliminate the steps of picking up a lock washer, slipping it in place and holding it until the piece is fastened. Production costs are definitely affected . . . for the better.

In addition, Reliance Springtites and Sems are easier to use in "hard-to-get-at" places, they are less apt to get lost and they offer an inventory that is automatically balanced... 1 lock washer and 1 bolt equal one Springtite or Sem.

Engineering bulletin S-49 will give you more complete details. Write for a copy and it's yours. No obligation.

RELIANCE DIVISION EATON® MANUFACTURING COMPANY

OFFICE and PLANTS: 550 Charles Ave. MASSILLON, OHIO

Springtites & Sems · Snap & Retaining Rings · Special Steels · Spring Lock Washers · Hex-Fas-Ner

SALES OFFICES: New York • Cleveland • Detroit • Chicago • St. Louis • San Francisco • Montreal

POLLARD ENGLAND

MANUFACTURE SOLID, FLEXIBLE AND MAXLOAD ROLLER BEARINGS

for DAVY-UNITED

AMONG THE WORLD'S LEADING ROLLING MILL BUILDERS

Full range available from 10 mm. to 35 mm. shaft diameter. All interchangeable with an equivalent to bearings of American type and manufacture.

Write for catalogues RFX and MAX/54. Also Ball, Roller, Thrust Bearings (Cat BRT/1053), Transmission Equipment and Plummer Blocks (Cat. T.R.27/2), Self-Lube Plummer Blocks (Cat. SL/2/54), Automobile and Tractor Replacements (Cat. BRM/54), Clutch Withdrawal and Water Pump Spindle Bearings (Cat. CWFP/54/A).

POLLARD BEARINGS LTD., KNOTTINGLEY, YORKSHIRE, ENGLAND *Phone: Knottingley 320 (5 Lines)*

LONDON OFFICE: 6 ST. JAMES PLACE, S.W.1. *Phone: Hyde Park 9248/9*

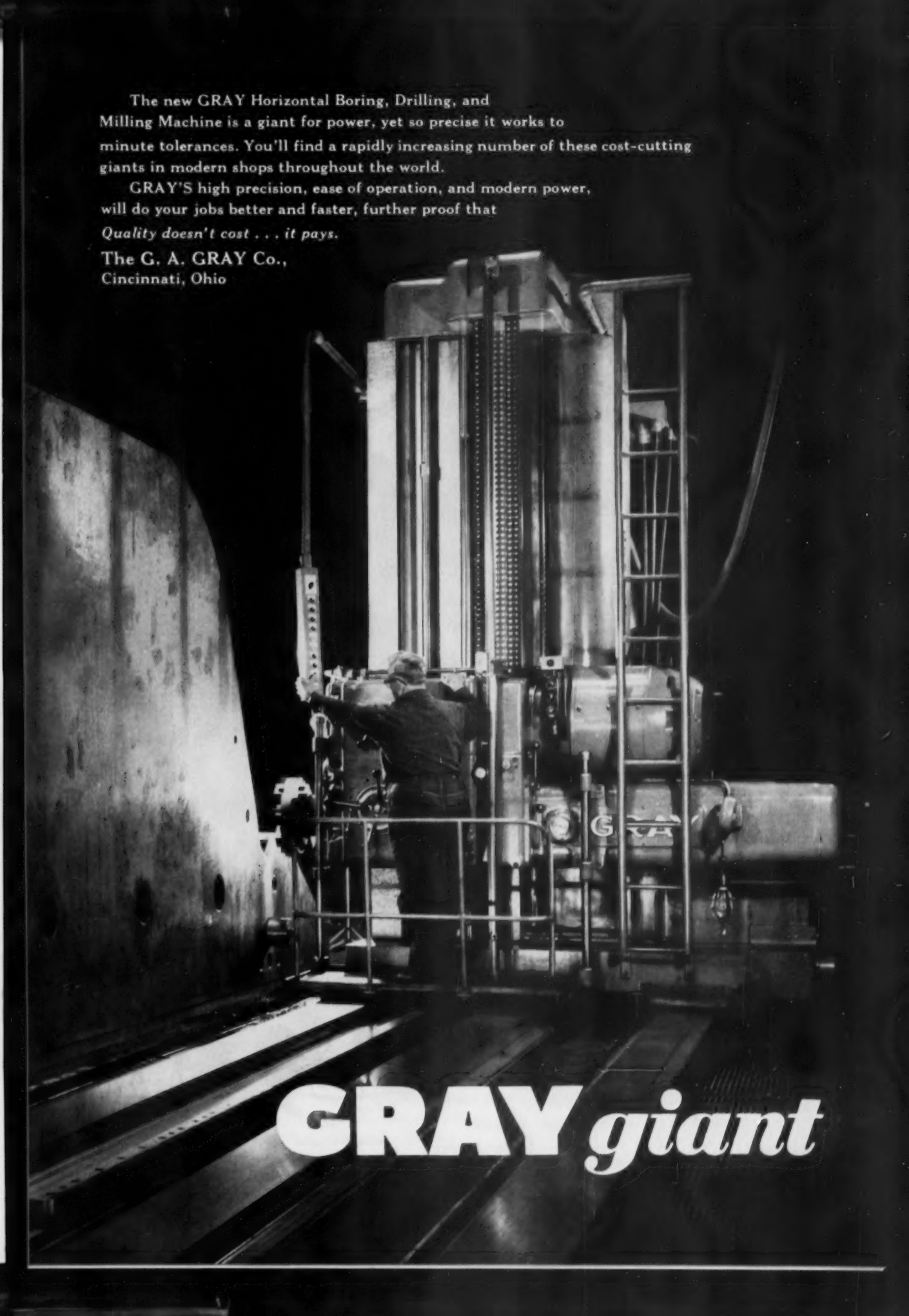
CANADIAN POLLARD BEARINGS LTD., 1103/5 Beaver Hall Hill, Montreal

PO/111

The new GRAY Horizontal Boring, Drilling, and Milling Machine is a giant for power, yet so precise it works to minute tolerances. You'll find a rapidly increasing number of these cost-cutting giants in modern shops throughout the world.

GRAY'S high precision, ease of operation, and modern power, will do your jobs better and faster, further proof that *Quality doesn't cost . . . it pays.*

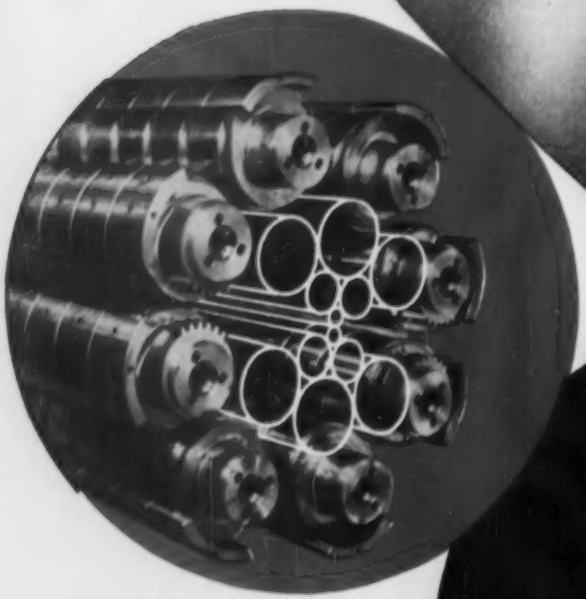
The G. A. GRAY Co.,
Cincinnati, Ohio



GRAY *giant*

This 80" SENDZIMIR MILL

maintains precise gauge across the width and along length of strip



Phantom view of roll arrangement

This Sendzimir cold strip mill rolls 80" wide low carbon steel from hot rolled thickness to .024" with total gauge variation of .0004". Similar uniformity is being regularly obtained on Sendzimir cold strip mills rolling brass, copper, aluminum, stainless steel, silicon steel, etc.

CONSIDER THE ADVANTAGES OF THE SENDZIMIR COLD MILL

- Extreme Accuracy In Gauge, Due To Uniform Support Throughout Mill
- Elimination Of Intermediate Anneals
- Greater Reductions Per Pass
- Highest Surface Finish
- Quick And Simple Roll Changes
- Low Initial And Maintenance Costs

SENDZIMIR MILLS

ARE ENGINEERED BY

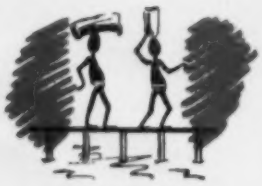
ARMZEN CO.

SALES & ENGINEERING AT WATERBURY 12, CONN. TEL. PLAZA 6-4617

FOREIGN: SENDZIMIR LTD., 75 Grosvenor St., London W1, England

PROCEDÉS SENDZIMIR S. A. R. L. 73 Blvd., Malesherbes, Paris 8, France

Backing Roll Support



Sendzimir Support

ALSO SENDZIMIR COLD SHEET MILLS—SENDZIMIR PLANETARY HOT STRIP MILLS

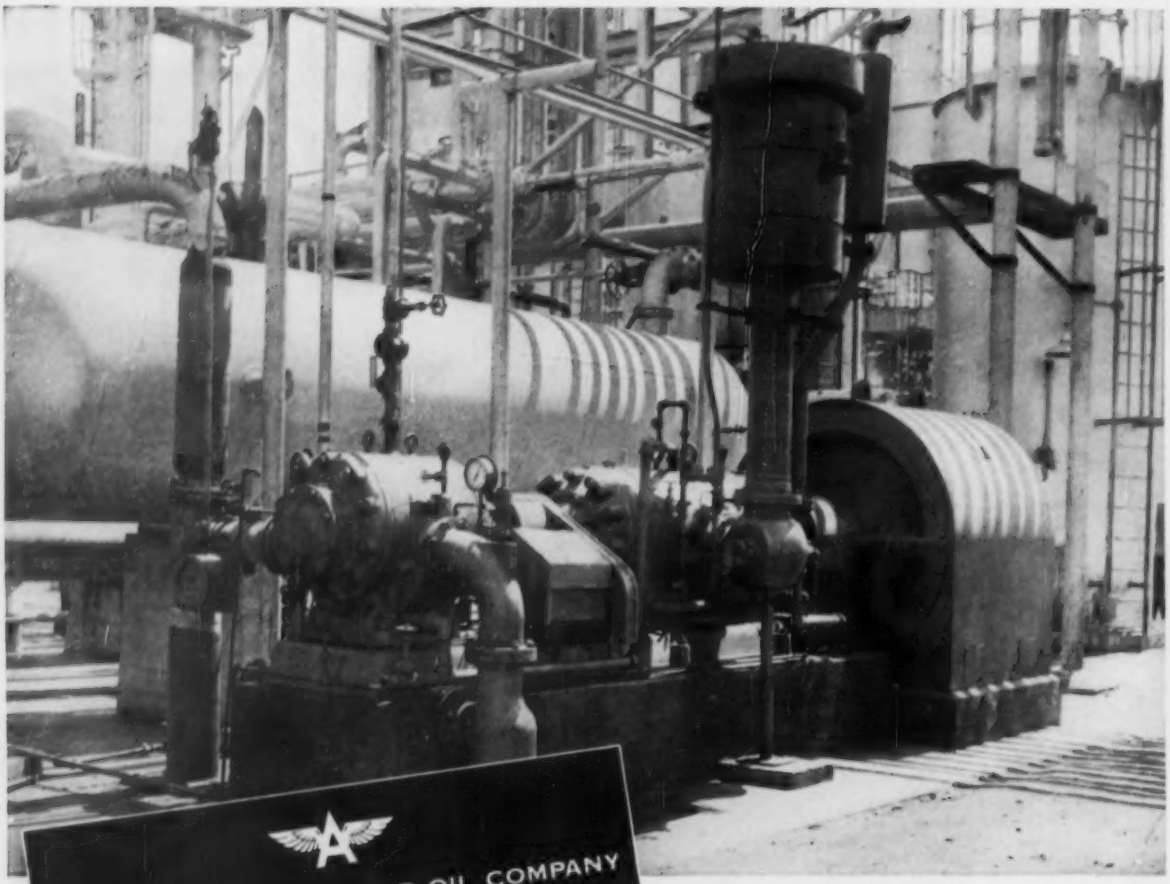
AR-4

Why Granite City Steel is growing 3 times faster than the industry!

Licking sheet steel problems for 77 years

Somewhere along the line, a steelmaker must make the same decision a doctor must make. Specialist or general practitioner? Granite City Steel decided 77 years ago to concentrate its time, skill and equipment into just one product—the best flat-rolled steel on the market.

This specialization has produced many benefits for Granite City Steel customers. Sheet steel buyers in Middle America have consistently found the *right* answer to their problems here—quicker and less expensively than they could at more diversified mills. Your sheet steel order never competes with other products at Granite City Steel. It gets the undivided attention of experts. Sales offices in St. Louis, Kansas City, Minneapolis, Memphis, Dallas, Houston, Tulsa.



installs fuller rotary compressors in its Avon Refinery

When Tide Water Associated needed additional air for various operations in its Avon plant, its engineers investigated the possibilities of the Fuller Rotary Compressor. After making a thorough study of its merits, Tide Water purchased and installed two C-300-300H two-stage units, each supplying 1598 c.f.m., 100-lb. air for general plant use, one of which is shown above. Note that this machine is installed out in the open with no protection from varying weather conditions, operating 24 hours per day, seven days a week.

These two-stage machines are located in different departments of the plant to best meet the air-load requirements of the particular department being served.

Tide Water also has installed in this same plant, two C-300 Fuller Rotary single-stage compressors with a capacity of 1542 c.f.m. each, at 40-lb. pressure, used in the catalyst-cracking process.

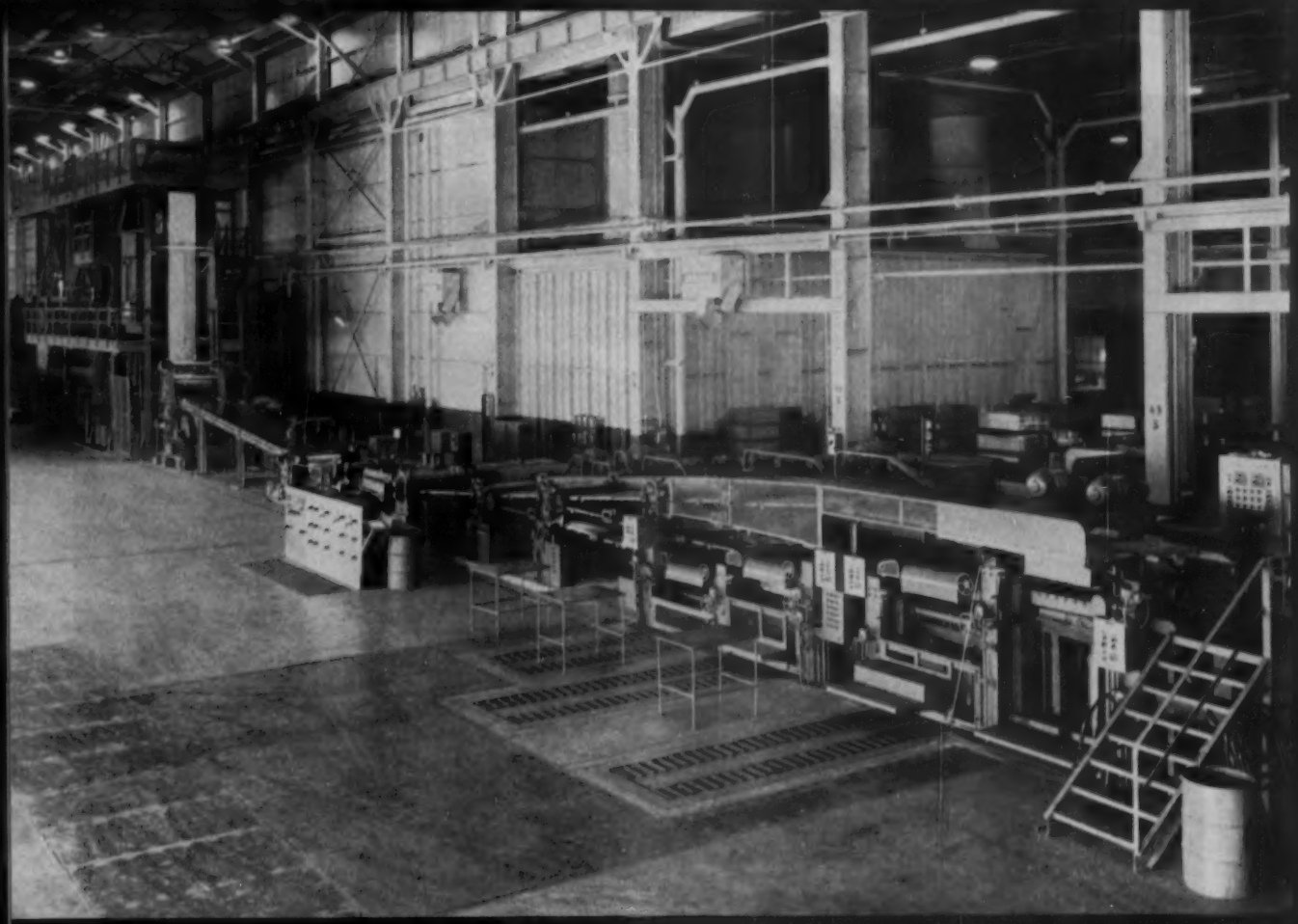
Hundreds of Fuller Rotaries are serving the petroleum industry, proving their worth for general plant air, purging gas, refrigeration in alkalization units, and handling butane-butylene in the refinery, as well as in the field for pressure boosting and gas gathering.

Simplicity of construction has proved to be one of the important factors—no valves to leak, no seats to grind, results in maintained capacity for the life of the machine; simplified drive eliminates power transmission losses. For full information write us for Bulletin C-5A.

Fuller
. . . . pioneers in harnessing AIR

FULLER COMPANY, Catasauqua, Pa.
GENERAL AMERICAN TRANSPORTATION CORPORATION SUBSIDIARY
Chicago · San Francisco · Los Angeles · Seattle · Birmingham

C-272
1572



NEW ELECTROLYTIC TINNING LINE

"Ferrostan" Electrotinning Line Acclaimed

built by ***AETNA-STANDARD***

for TENNESSEE COAL & IRON DIVISION, U. S. STEEL CORPORATION

More rugged design, improved Tracking, Shearing and Classifying, Pickling and Cleaning. Line is designed to be the largest capacity, highest speed line of its type to date.

THE AETNA-STANDARD ENGINEERING COMPANY · PITTSBURGH, PA.

Aetna-Standard

PLANTS IN WARREN, OHIO · ELLWOOD CITY, PENNSYLVANIA

GOOD EQUIPMENT BRINGS DOWN PRODUCTION COSTS

Brainard
SHARONSTEEL
STEEL DIVISION
SHARON STEEL CORPORATION

FREE BRAINARD STRAPPING SERVICE BULLETIN tells you why it pays to do business with Brainard. Mail coupon today or call your near-by Brainard strapping expert for an on-the-job demonstration.

Brainard Steel Division
of the Sharon Steel Corporation
Dept. I-10, Griswold Street, Warren, Ohio

☐ Please send me your free Strapping Service bulletin.

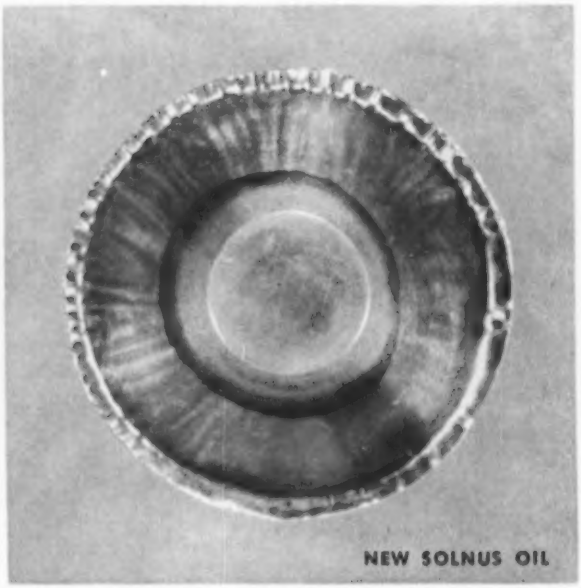
☐ I would like to have a Brainard representative call.

Name_____

Company_____

City_____ State_____

To demonstrate the comparative deposit-forming tendencies of compressor oils, two drops of a typical compressor oil were heated until evaporated. Notice the large deposit, *most of which is carbon*, left by the typical compressor oil. A new Solnus oil, after the same evaporation test, leaves a much smaller deposit.



NEW SOLNUS OILS HELP KEEP COMPRESSORS CARBON-FREE

THREE MINUTE TEST right at your desk shows why Solnus oils are the best for your compressors.

The chief enemy of air compressors is carbon build-up. The best way to avoid this hazard is to use the compressor oil that has the lowest carbon-forming tendency.

Sun's new Solnus oils have been proved to be ideal compressor lubricants. The minute amounts of carbon that form are fluffy and blow away easily . . . assurance against dangerous build-up of carbon on valves and exhaust ports. Tear-downs for cleaning are kept to a minimum.

We'd like to show you, right on your desk top, the dramatic test pictured above. Ask your Sun representative about it the next time he calls or write SUN OIL COMPANY, Philadelphia 3, Pa., Dept. SI.

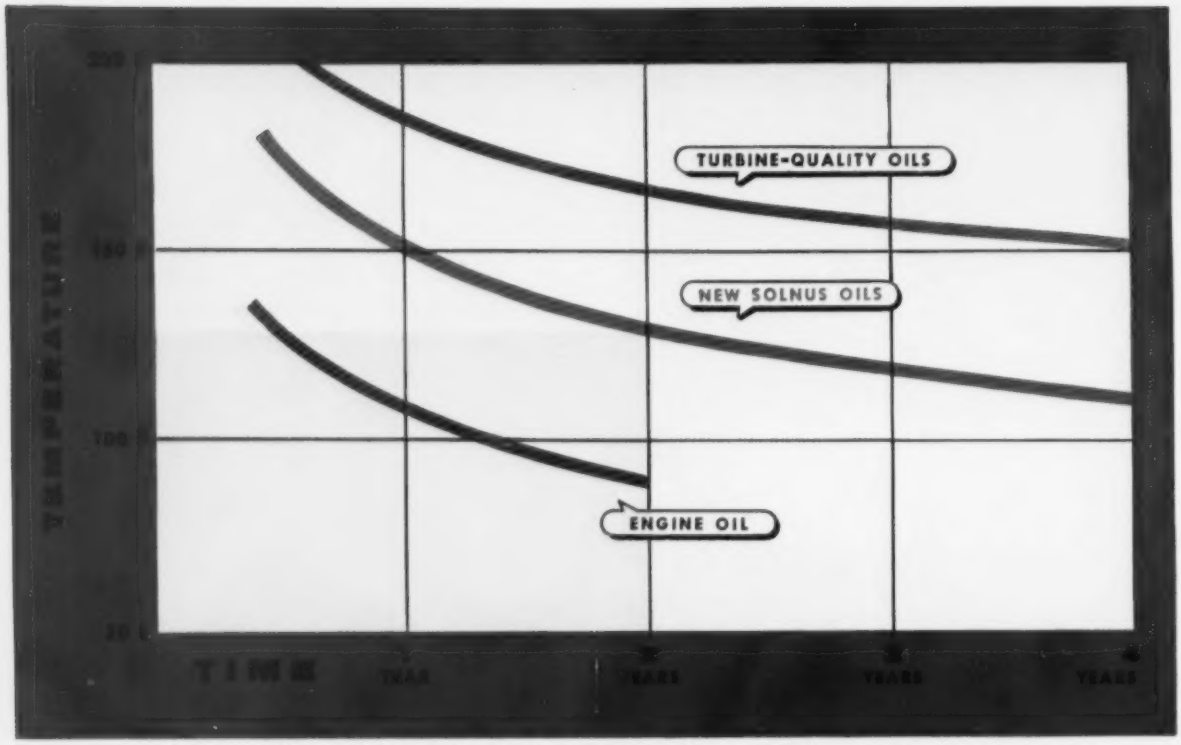
Please turn to the next page

SUNOCO

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY PHILADELPHIA 3, PA.

IN CANADA: SUN OIL COMPANY, LTD., TORONTO AND MONTREAL



This graph is based on 10% make-up per year and a 40-hour week.
The yellow area represents approximately 80% of all applications.

NEW SOLNUS OILS IDEAL LUBRICANTS FOR 80% OF ALL APPLICATIONS

High grade lubricants for squirt-can prices . . . New Solnus oils give more lubrication per dollar

The lubricated parts of most machines—our estimate is 80%—operate at temperatures below 130 F and the time between oil changes is less than 2 years. New Solnus oils were specifically developed to meet these operating conditions at the lowest possible cost.

The above graph compares the service life of new Solnus oils with that of an expensive, turbine-quality oil, and an oil of the type old-timers call "engine oil". The service life of the turbine-quality oil is excellent and probably covers 99% of all applications . . . but for a premium price! The engine oil has a very limited life. It cannot be used safely, except for a very short time, at even moderately high operating temperatures, and it gives very little protection against rust and corrosion.

Now look at the service life of new Solnus oils. They easily meet the service requirements of at least 80% of all oil lubrication jobs and they sell for a squirt-can price! In addition, new Solnus oils are fortified to prevent both rust and oxidation . . . a feature usually found only in more expensive oils.

For the full story on new Solnus oils, see your Sun representative or write Sun Oil Company, Philadelphia 3, Pa., Dept. SI.

SUNOCO

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY

PHILADELPHIA 3, PA.

In Canada: Sun Oil Company, Ltd., Toronto and Montreal

WHENEVER you need
SPECIAL STEELS
for special purposes
check first with
Ingersoll

• carbon electric steel for tank clutch discs • alloy steels • armor plate • clutch plate steels • tillage steels • soft center steel • shovel steels • knife steels • saw steels, including high speed hack saw blade steels • Tem-Cross steel • heat-resisting steels • stainless steels • IngAclad stainless-clad steel • forging quality electric steel ingots

INGERSOLL STEEL
B-W
BORG-WARNER

Ingersoll STEEL DIVISION

Borg-Warner Corporation • NEW CASTLE, INDIANA

LOOK TO THIS NEW, PRODUCTION-BOOSTING LINE

50 THROUGH 300-TON CAPACITIES

America's Most Complete Line of Presses, Shears, Machines and Tools for Plate and Sheet Metal Work

For a realistic answer to the metal stamping and forming problems of today... and tomorrow

DESIGN MODERNIZATION CONCEALS DRIVING MECHANISM

Fully streamlined, enclosed construction, front and back, provides pronounced advantages. There are no exposed, overhanging flywheel, clutch, brake, intermediate shaft, nor motor in rear of press to obstruct crane service, block light, throw grease and consume floor space unnecessarily ... yet all parts are quickly accessible.

WORK-SAVING FLEXIBILITY MEETS SHIFTING PRODUCTION NEEDS

Box type welded steel slides are power adjusted through self-locking, worm driven, barrel type connections to accommodate a wide range of die heights and to permit quicker, easier and safer die setting. Niagara electric clutch control provides trouble-free push button operation and a five-position selector switch for ease, safety and efficiency in single stroking, continuous running, jogging, reverse jogging and slide adjustment.

RUGGED, HEAVY DUTY FRAMES PROLONG DIE LIFE

All-steel, rigidly constructed frames, featuring an exclusive triple box section design, provide maximum resistance to deflection from horizontal, diagonal and torsional stresses. Greater accuracy and longer die life are thereby assured.

GREAT SHUT HEIGHT AND LONG SLIDE ADJUSTMENT

Unusually liberal shut height and extremely long slide adjustment, of both one and four-piece frame construction, permit use of a tremendous range of stamping and forming dies.

Hailed as the most progressive step in straight side, double crank press history, the new Niagara SC-2 Press Series could only have originated from a keen insight of today's metal working problems and the more challenging ones of tomorrow. In every detail of design, you'll recognize the unduplicated competence of Niagara engineers. Who else would be more mindful of press users' needs than the men who design and build America's leading and most complete line of presses, press brakes, shears, other machines and tools for plate and sheet metal work?

CHECK THE FEATURE-BY-FEATURE EVIDENCE

Preview this complete new line of straight side presses at once. Find out what they can do for you. Write for Niagara's new, illustrated Bulletin 64-H today.

NIAGARA MACHINE & TOOL WORKS
BUFFALO 11, N. Y.

DISTRICT OFFICES:
Buffalo • Detroit • Cleveland • New York • Philadelphia
Dealers in principal U. S. cities and major foreign countries

NIAGARA

STRAIGHT SIDE DOUBLE CRANK PRESSES

Unique test furnace assures you of better end wall service

with Kaiser Periclase-Chrome Brick

THE refractory test furnace shown at the right was designed by Kaiser Chemicals to aid in the development of superior basic refractories for the steel industry.

One of the most important of its functions is to regularly test the effect of iron oxide and steel furnace slag on various bricks—including Kaiser Periclase-Chrome Brick.

As a result of such careful quality development and control, Kaiser Periclase-Chrome Brick are superior in your furnace—assuring less spalling, less swelling, greater resistance to abrasion and alteration by oxide and slag.

Leading steel producers have found that Kaiser Periclase-Chrome Brick can greatly increase end wall life or greatly reduce wall thickness, when this is preferred.

Let your Kaiser Chemicals sales engineer show you how you can get longer life from your end walls or reduced wall thicknesses with Kaiser Periclase-Chrome Brick. Call or write any of the sales offices listed below for immediate attention to your particular problem.

Call or write Kaiser Chemicals Division, *Kaiser Aluminum & Chemical Sales, Inc. Regional Sales Offices: 1924 Broadway,* OAKLAND *12, Calif. . . . 3 Gateway Center,* PITTSBURGH, *Pa. . . . 518 Calumet Building, 5231 Hohman Ave., Hammond, Indiana* (CHICAGO).

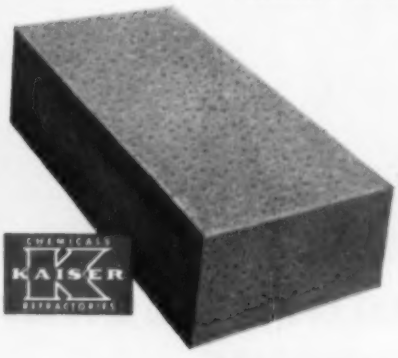
For the ultimate in steel furnace refractories

SOME OF THE REASONS YOU GET BETTER SERVICE WITH KAISER PERICLASE-CHROME BRICK:

1. Chromite content is the minimum amount (only 9.1% Cr_2O_3) necessary to provide thermal shock resistance. Lowering of chromite reduces swelling, thus minimizes end wall buckling.
2. A ceramic bond is formed *before* the chemical bond is destroyed.
3. No liquid phase in forming its ceramic bond. Volume stability.
4. Highest MgO content in end wall brick provides greater resistance to carryover erosion and iron oxide attack.
5. Lowest porosity minimizes alteration by resisting penetration of gases and impurities.

think of Kaiser Chemicals

Pioneers in Modern Basic Refractories



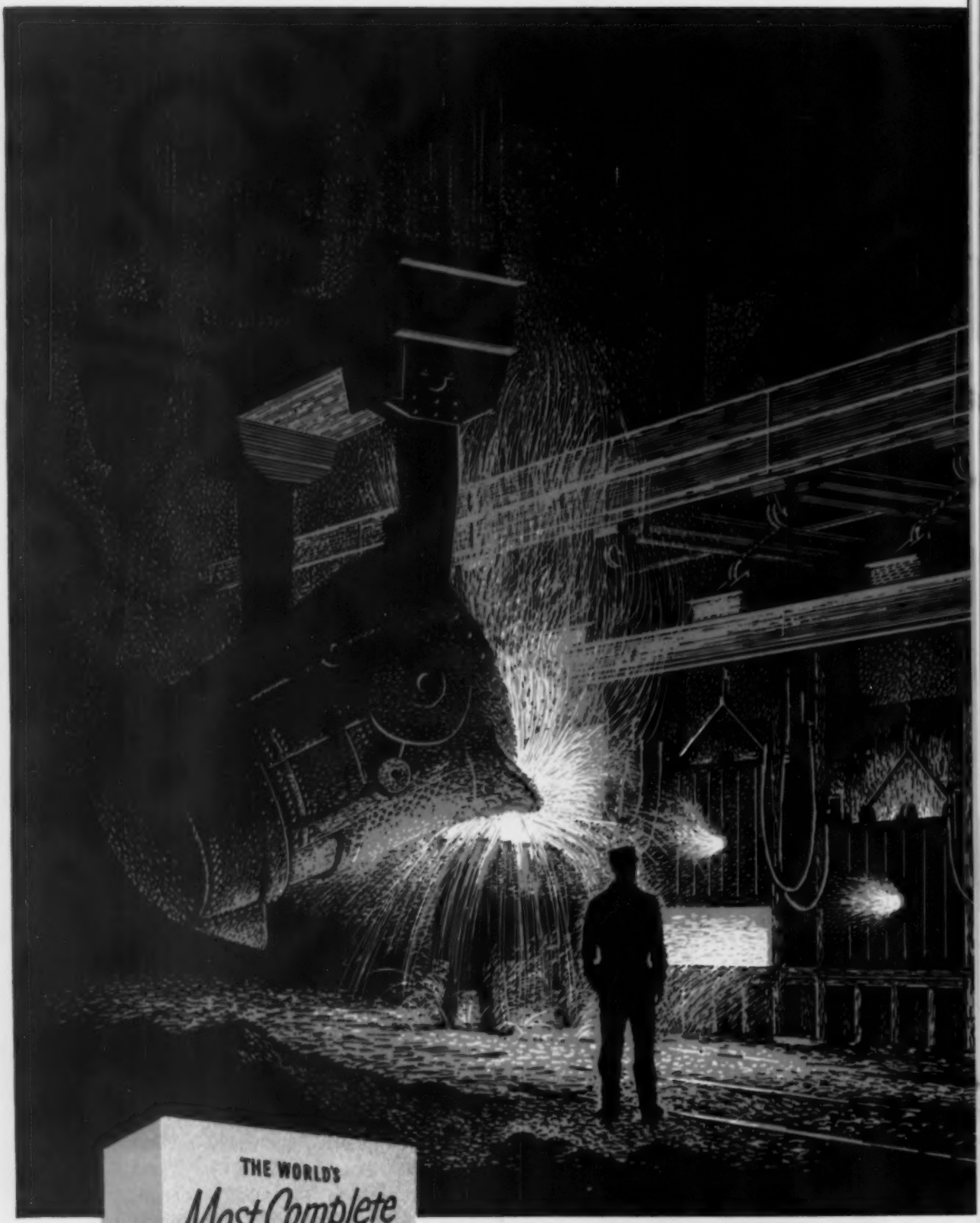
REFRACTORY BRICK • RAMMING MATERIALS • CASTABLES & MORTARS • MAGNESITE • PERICLASE • DEADBURNED DOLOMITE

Kaiser PERICLASE Brick for the Steel Industry:

- Kaiser Periclase Brick (D-S)
- Kaiser Periclase Chrome Brick
- Kaiser Chrome Periclase Brick

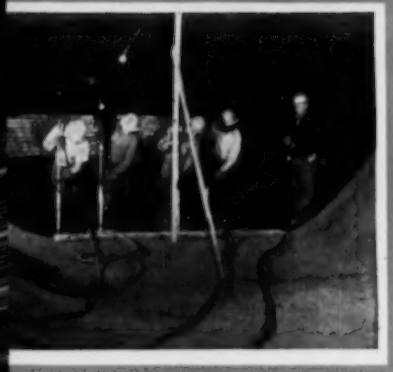
***Now available!* A companion mortar for Kaiser D-S brick. High purity periclase composition *and* maximum workability.**

Installation advice on request



HARBISON-WALKER
AND SUBSIDIARIES

Harbison-Walker



OPEN-HEARTH REFRACTORIES

help reduce steel-making costs

Open-hearth steel furnaces are industry's largest users of refractories. In these furnaces—in which by far the major portion of the world's steel is made—exceedingly severe and widely differing conditions call for refractories of highest quality and having particular combinations of physical and chemical properties. And here the use of Harbison-Walker products continues to reduce operating and maintenance costs.

Among these refractories that give outstanding service are: H-W METALKASE, a metal-encased basic brick pioneered by Harbison-Walker; CHROMEX (chemically bonded) and CHROMEX B (extra hard fired) chrome-magnesite brick; STAR (conventional) and VEGA (the original super-duty) silica brick; H-W C MIX and H-W MAGNAMIX, superior monolithic materials for basic bottoms; FORSTERITE L and various other types and classes for regenerator checkers.

In addition, Harbison-Walker manufactures the full complement of types and classes of high alumina, fire clay and insulating fire brick, and the complete range of castables and plastic refractories for every application.

Technical service based on the most extensive experience and research is freely offered for assistance in determining the refractories best suited for each specific requirement.

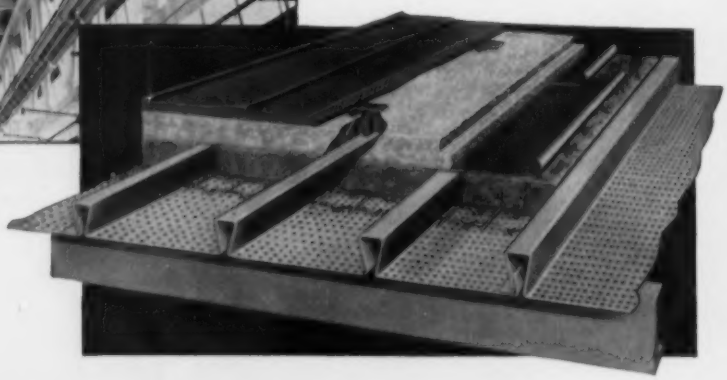
REFRACTORIES COMPANY

World's Largest Producer of Refractories • General Offices—Pittsburgh 22, Pa.

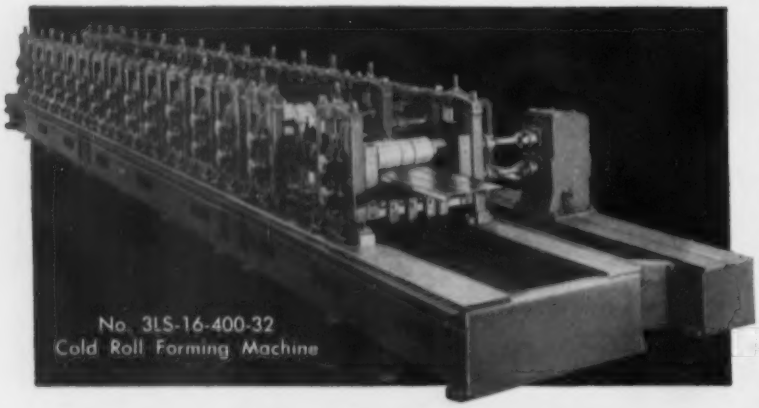
"...satisfactorily produced millions of feet of Holorib roofing", says Mr. N. E. Hubbell

Buffalo Plant Mgr.
Detroit Steel Products Company

"Since 1930 Kane & Roach machinery has satisfactorily produced millions of feet of Holorib roofing — a section which cannot be easily roll formed. When our production increased we called on K & R in 1946 to furnish additional equipment."



Shown above: Installation of Fenestra Acoustical Holorib Ceiling



No. 3LS-16-400-32
Cold Roll Forming Machine

Millions of feet of easily-erected Fenestra roof ribbing have been handled rapidly and accurately on Kane & Roach machines. Nominally rolled from 18 gauge coiled stock the machine forms both plain and perforated sheets. A flying cut off is employed at the discharge end permitting continuous operation of machine in cutting lengths to meet customers' specifications.

Write or wire us today. Our production-tailored engineering can help you cut costs and up production in your plant.

Kane & Roach

INCORPORATED

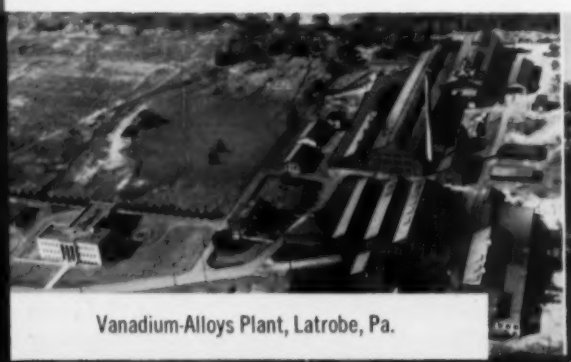
SYRACUSE, NEW YORK • ESTABLISHED 1887

Vanadium-Alloys Steel Company

world's largest exclusive manufacturer of Tool Steels

—the capacity, the facilities, the skill and the will to serve you better!

Five manufacturing plants in the U.S. and Canada, twelve branch offices, well-stocked warehouses, a network of distributors in the major metal-working areas and individualized truck delivery provide the measure of our service ability. The First Quality of our tool steels is assured by complete specialization in manufacture and an unremitting concentration upon perfection, every working day in the year.



Vanadium-Alloys Plant, Latrobe, Pa.

Colonial Steel Plant, Monaca, Pa.

Anchor Drawn Steel Plant, Latrobe, Pa.

Pittsburgh Tool Steel Wire Plant, Monaca, Pa.

Hot Rolled Products from mills up to 22" diameter • Cold Drawn Products • Circles • Forgings • Standard and Special Shapes in High Speed, Die Steel and Special Tool Steel Compositions

Vanadium-Alloys Steel Canada Limited, London, Ont.

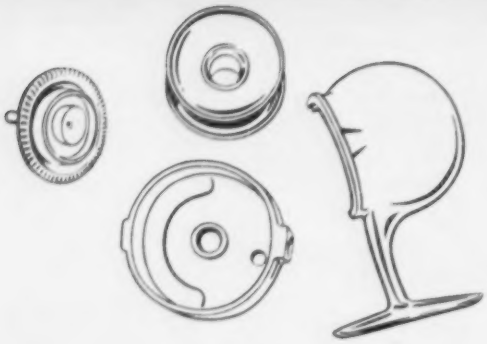
Vanadium-Alloys Steel Company

Latrobe, Pennsylvania

Subsidiaries: Colonial Steel Co. • Anchor Drawn Steel Co. • Pittsburgh Tool Steel Wire Co. • Vanadium-Alloys Steel Canada Limited • Vanadium-Alloys Steel Societa Italiana Per Azioni

visit us at the Metal Show booth 104

Another field report on "TRICLENE"® D



HIGHLY POLISHED PARTS of the Airex spinning reel are made from five different metals. To clean them all quickly and thoroughly takes just a single degreasing operation with All-Purpose TRICLENE D.

AIREX–fishing reel manufacturer–finds: TRICLENE® D

gives brighter cleaning...cuts degreasing time in half

BRIGHT, THOROUGHLY CLEAN aluminum-zinc die castings are removed from the vapor degreaser at Airex Manufacturing Co. TRICLENE D is used by Airex to give fast, efficient, trouble-free degreasing.

Airex Manufacturing Co., of Hillside, N. J., uses parts made of five different metals in its popular spinning reel—aluminum, brass, copper, steel and zinc. Many of the parts are highly polished. Originally, some degreasing operations had to be carried out twice to assure thorough cleaning.

When Airex changed to TRICLENE D trichlorethylene, they substantially cut their degreasing time. *In a single operation,* Du Pont's efficient new solvent gives them the thorough, safe, trouble-free degreasing they need. And TRICLENE D cuts maintenance costs, too: Adjustment of solvent pH is no longer necessary...and the time between degreaser cleanouts is now six to eight weeks instead of two.

Locked-in stabilizers give TRICLENE D unsurpassed resistance to *all* major causes of solvent deterioration—heat, light, air, acids and aluminum chloride—yet this rugged solvent contains nothing to harm even delicately machined metal surfaces. TRICLENE D retains its original high purity longer . . . continues to give *brighter cleaning of any metal,* job after job, distillation after distillation. And remember, it costs no more!

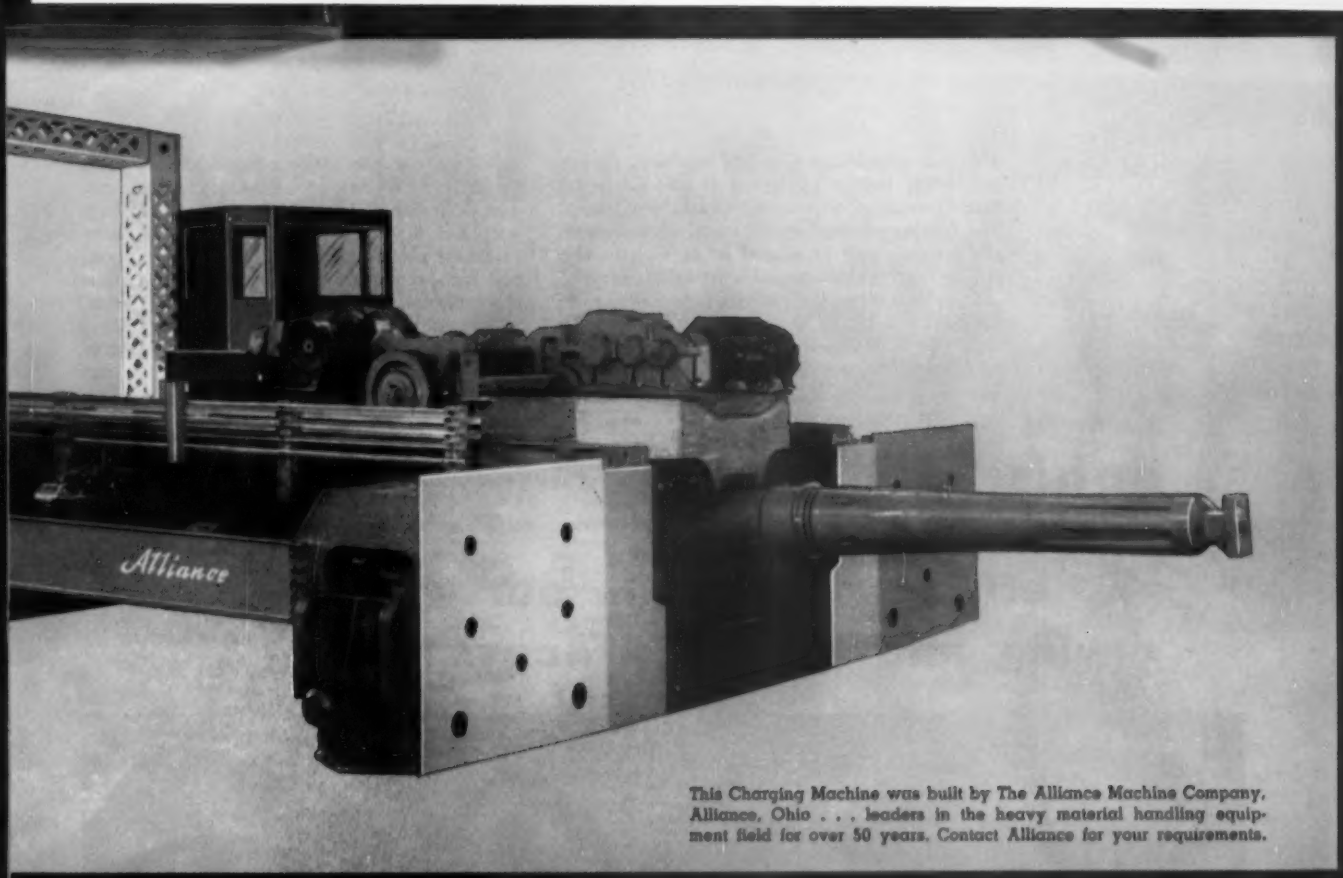
FOR MORE INFORMATION about TRICLENE D and how it can bring a new standard of efficiency to your vapor degreasing operation, write to the nearest District Office of the E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

TRICLENE® D

TRICHLORETHYLENE



This Charging Machine was built by The Alliance Machine Company, Alliance, Ohio . . . leaders in the heavy material handling equipment field for over 50 years. Contact Alliance for your requirements.

LADLE CRANES

GANTRY CRANES

FORGING MANIPULATORS

SOAKING PIT CRANES

STRIPPER CRANES

SLAB AND BILLET CHARGING MACHINES

OPEN HEARTH CHARGING MACHINES

SPECIAL MILL MACHINERY

STRUCTURAL FABRICATION

COKE PUSHERS

•

New 12-TON CHARGING MACHINE

• **The NEW Alliance 12-ton,** low-type open hearth Charging Machine has spring-loaded pitman so, if the charging box pushes up over scrap in the furnace, the trolley's front wheels remain on the rails. Trolley always has sufficient traction to retract peel and box from furnace.

• **Each bridge girder** of Alliance's NEW Charging Machines consists of two wide-flanged I-beams welded to form a box section. Between webs of this box section, diaphragms are welded at 3-ft. intervals. This, plus other welded reinforcements, keeps charging machine square and rigid.

• **Machinery deck plate,** extending full length of bridge between main girder and outrigger girder, laterally reinforces the main girder and helps keep charging machine square and stable under all operating conditions.

• **Stabilized, shock-absorbing wheels** operate at rear end of trolley. Two rear wheels engage upper rail; two adjacent wheels engage lower rail. Powerful springs hold wheels in contact with rails at all times. This spring suspension absorbs and disperses engaging and disengaging shock at end of the peel, reducing operator shock and fatigue to a minimum.

• **On eight-wheel bridges,** the four trucks located at corners of the bridge are equalized to compensate for any track irregularities.

• **New hydraulic lock rod** gives operator finger-tip control and eliminates laborious work incident to the hand-operated lock rod. All gears (including track wheel gears) are fully enclosed and run in oil.

WORLD'S LARGEST BUILDERS OF WORLD'S LARGEST CRANES

Founded 1901

THE *Alliance* MACHINE COMPANY

MAIN OFFICE • ALLIANCE, OHIO

GIVE US THE RUNWAY AND WE'LL LIFT THE WORLD

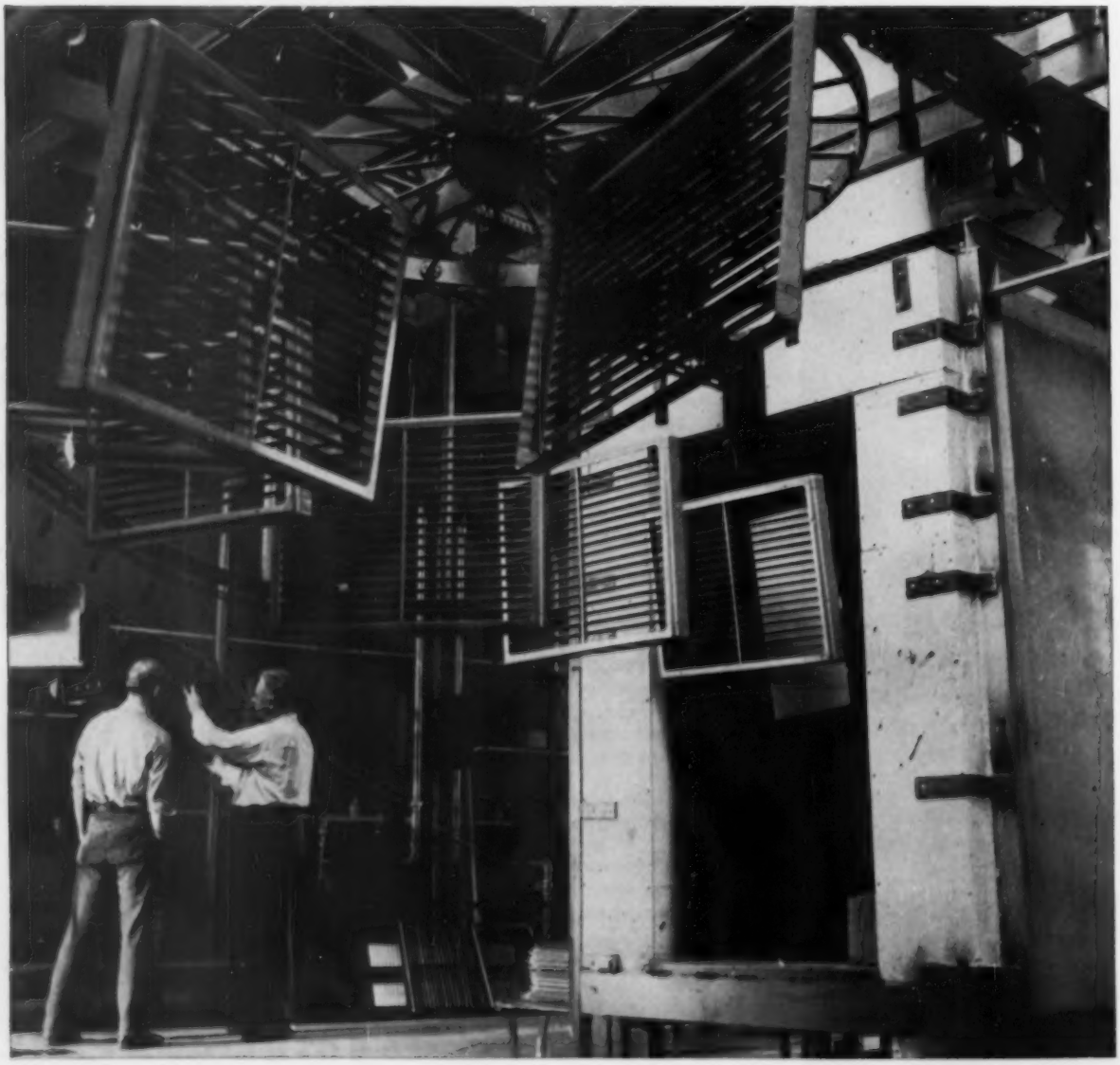
This is a continuous Gas-fired washing, drying and finish baking operation at the Seaboard Metal Products Company in Newark, New Jersey. The company manufactures metal enclosures of all types, as well as related items such as the radiant heating unit covers shown on the conveyor.

The versatility of these Gas-fired units, with a heat input up to five million BTUs, helped owner John Murray convert his shop from a small jobbing to a straight production operation. The units can take any type baking or drying job. Overhead conveyors permit a fast flow of irregular as well as uniform shaped pieces.

Throughout the entire process at Seaboard, Gas is installed as part of the production line. The flexibility of Gas allows close temperature control in a series of chemical baths and rinses preceding the drying and paint-baking process, and without expensive heat-up periods. Gas is this company's choice for fuel because it is faster, cleaner, and keeps operating costs down.

Throughout all industry, Gas is the most satisfactory method of heat processing. That's reason enough for discussing your production problems with your Gas Company's Industrial Specialist. *American Gas Association.*

"GAS efficiency speeds our washing, drying and baking process"



IT TAKES MORE THAN THESE

...to build a bridge

IT TAKES MORE THAN THESE

...to heat treat metals

BOTH MUST HAVE THE VITAL INGREDIENTS — SKILL AND EXPERIENCE

It is a sad fact that many skilled production men and managers have been, in recent years, badly misled into believing that given a furnace — a quench tank — a salt bath, and a corner of floor space — they can promptly and easily fulfill their heat treating requirements. Aggressive and misleading selling by some furnace and equipment manufacturers (fortunately only a small minority) has encouraged this misconception that equipment and materials alone are the essential factors in heat treating operations.

The cold fact is, that without the proper combination of human operational skill and technical knowledge developed over **years** of practical experience, even the best, most mechanical, most modern heat treating equipment becomes a potent menace to your product and your profit margin.

Careful evaluation of **all** the factors involved in any heat treating operation — large or small — always reveals that TECHNICAL SKILL BORN OF EXPERIENCE tops the list.

Make it head **your** list when you are analyzing the pros and cons of the question "Shall we do our own heat treating?" Write for a useful folder — "Facts and Figures on Heat Treating Costs".

THERE'S A HEAT TREATING SPECIALIST NEAR YOUR PLANT

Ace Metal Treating Corp.
Elizabeth, New Jersey

Allied Metal Treating Corp.
Kenosha; Manitowoc; Racine, Wisconsin

Anderson Steel Treating Co.
Detroit, Michigan

B. & W. Precision Heat Treating Co.
Kitchener, Ontario, Canada

Benedict-Miller, Inc.
Lyndhurst, New Jersey

Bennett Heat Treating Co., Inc.
Newark 3, New Jersey

Commercial Metal Treating, Inc.
Bridgeport, Conn.

Cook Heat Treating Co. of Texas
Houston 11, Texas

The Dayton Forging & Heat Treating Co.
Dayton 3, Ohio

Drever Company
Philadelphia 33, Pennsylvania

Greenman Steel Treating Company
Worcester 5, Massachusetts

Fred Heinzelman & Sons
New York 12, New York

MTI
METAL TREATING INSTITUTE

Alfred Heller Heat Treating Co.
New York 38, New York

Hollywood Heat Treating Co.
Los Angeles 38, California

L-R Heat Treating Company
Newark, New Jersey

The Lakeside Steel Improvement Co.
Cleveland 14, Ohio

Metallurgical, Inc.
Minneapolis 14, Minnesota

Metallurgical, Inc.
Kansas City 8, Missouri

Metlab Company
Philadelphia 18, Pennsylvania

Metro Heat Treat Co.
New York 13, New York & Ridgefield, N. J.

New England Metallurgical Corp.
South Boston 27, Massachusetts

Paulo Products Company
St. Louis 10, Missouri

Pittsburgh Commercial Heat Treating Co.
Pittsburgh 1, Pennsylvania

The Queen City Steel Treating Co.
Cincinnati 25, Ohio

J. W. Rex Company
Lansdale, Pennsylvania

Stanley P. Rockwell Company
Hartford 12, Connecticut

C. U. Scott & Son, Inc.
(Stainless Steels)
Rock Island, Illinois

Standard Steel Treating Co.
Detroit 10, Michigan

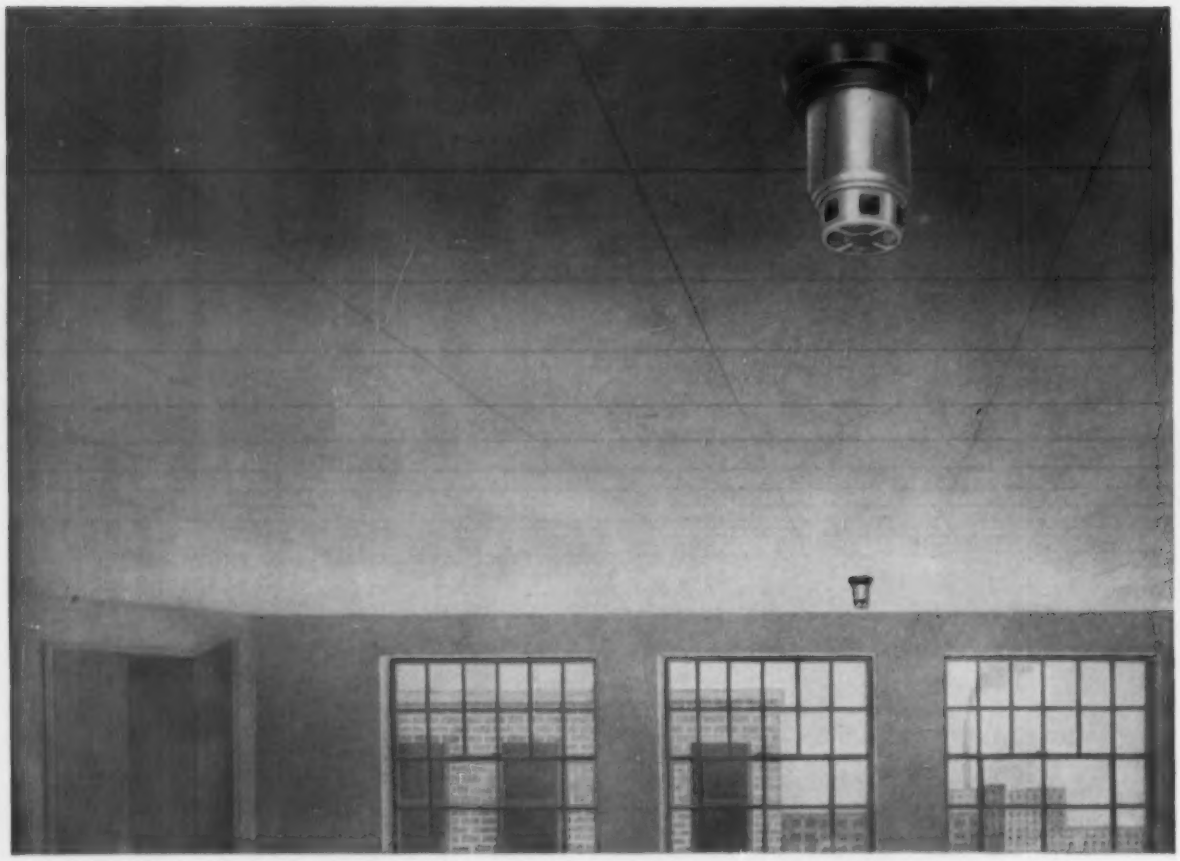
Syracuse Heat Treating Corp.
Syracuse, New York

Wisten Heat Treating Company
Cleveland 16, Ohio

This advertisement sponsored by these Companies which are members of the Metal Treating Institute.

New, radio-active, automatic fire guard!

C-O-TWO PRE-DETECTOR SYSTEM



Each pre-detector head protects up to 3,600 square feet of area . . . harmless radio-active element utilizing ionization chamber principle quickly detects all forms of fire . . . requires only simple two-wire circuit and insignificant wall space for controls.

This completely new and positive means of spotting fire is just what you've always needed and wanted . . . detects in the earliest stage, invisible combustion gases, visible smoke, slow smoldering, as well as open flame. The C-O-TWO Pre-Detector System is simple to install, extremely economical to maintain and doesn't depend on thick smoke or heat for actuation.

As many pre-detector heads as necessary can be connected together in a single circuit and up to 16 separate circuits or spaces handled by one system. With a single circuit the pre-detector heads are connected directly to the fire indicating cabinet, while with multiple circuits the pre-detector heads are first connected to one or more space indicating cabinets capable of visually showing by number the exact location of the fire. Relays perform such functions as sounding alarms, closing fire doors, shutting down ventilation and releasing fire extinguishing systems.

The C-O-TWO Pre-Detector System has been subjected to extensive testing and carries Underwriters' Laboratories, Inc. listing, as well as Factory Mutual Laboratories approval. Proven pilot installations have been made in such diversified properties as a television station, an electric power company network analyzer room, a railroad signal tower, an airline flight training equipment room and the offices of an insurance company.

Don't take unnecessary chances any longer . . . the extensive fire protection experience of PYRENE—C-O-TWO over the years is at your disposal without obligation. Get complete facts about this new C-O-TWO Pre-Detector System today!

Pyrene

PYRENE — C-O-TWO

NEWARK 1 • NEW JERSEY

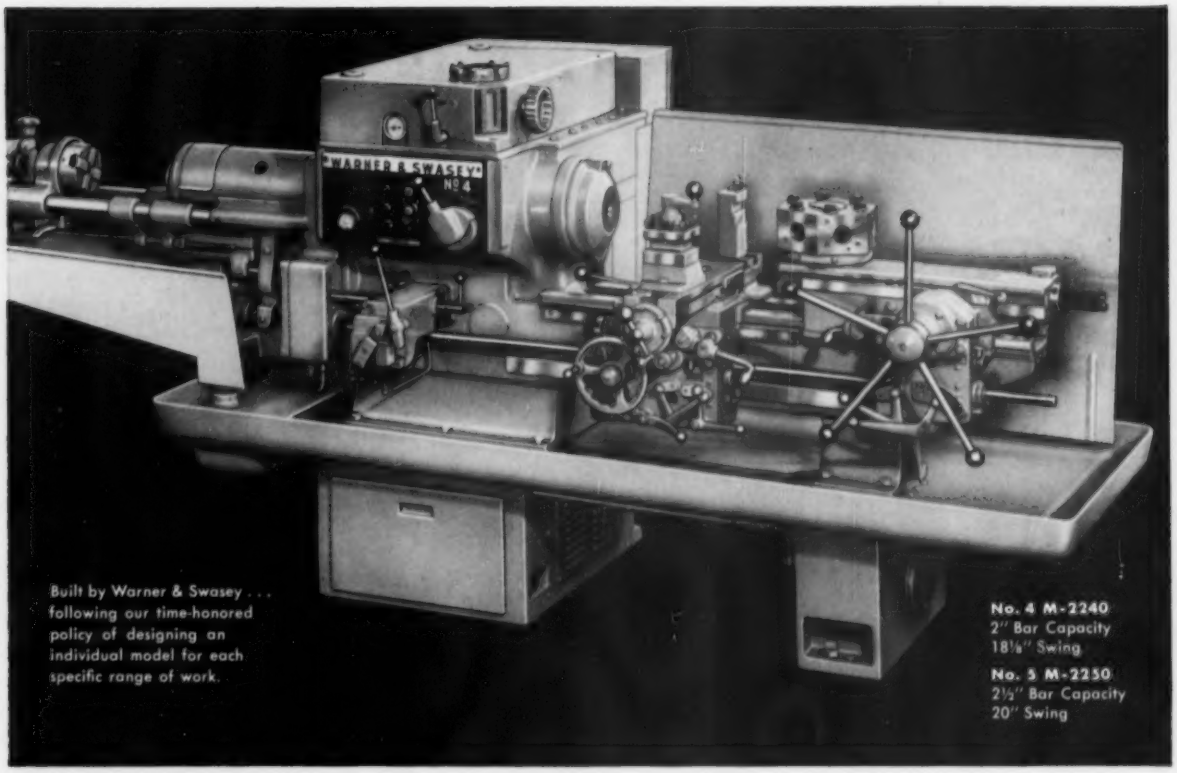
Sales and Service in the Principal Cities of United States and Canada

C-O-TWO

COMPLETE FIRE PROTECTION

portable fire extinguishers . . . built-in fire detecting and fire extinguishing systems

CARBON DIOXIDE • DRY CHEMICAL • VAPORIZING LIQUID • SODA-ACID • WATER • CHEMICAL FOAM • AIR FOAM



Built by Warner & Swasey . . . following our time-honored policy of designing an individual model for each specific range of work.

No. 4 M-2240
2" Bar Capacity
18⅛" Swing

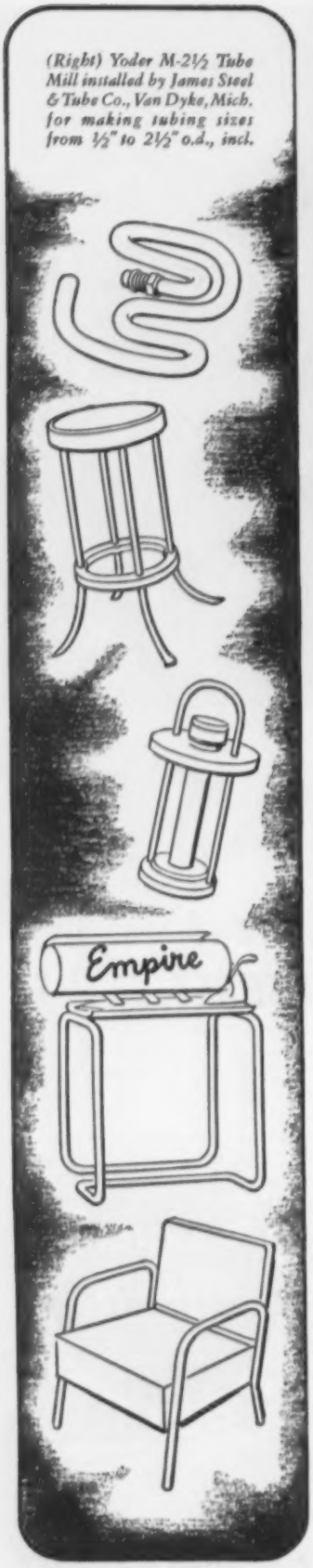
No. 5 M-2250
2½" Bar Capacity
20" Swing

WARNER & SWASEY introduces NEW No. 4 and No. 5 RAM TYPE TURRET LATHES

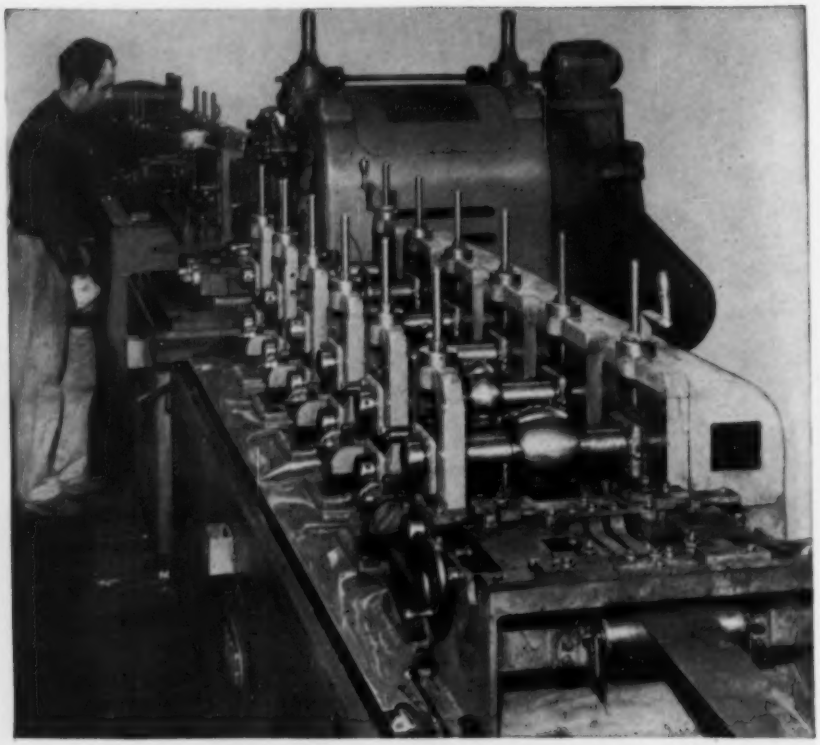
- Higher Speeds
- Instantaneous speed changes—sliding gears eliminated
- Direct-acting hydraulic clutches—need no adjustment
- Smooth, quiet running, helical high-speed gears
- Short, stubby shafts—anti-friction bearings throughout
- Single lever control for forward, reverse, brake and free spindle
- One lever control for speed changes and 6:1 ratio high-low shift
- Two-speed motor provides 24 *unduplicated* speeds, forward and reverse, with a 62.5 to 1 over-all range
- Flange-mounted, direct-drive motors—no belts
- Patented direct-reading speed preselector—calibrated in rpm's, surface speed and work diameter
- Rigid, heavy-duty, high speed hydraulic bar feed with adjustable feed-out
- Single lever control for hydraulic collet chuck and bar feed
- Zoned operating controls for effortless machine operation
- One-piece head and bed for greatest possible accuracy
- Larger, separate oil sump provides cooler filtered oil
- Retains Warner & Swasey standard tooling interchangeable with your present models

75TH ANNIVERSARY YEAR
WARNER & SWASEY
Cleveland
PRECISION MACHINERY
1880 — 1955

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS...WITH A WARNER & SWASEY



(Right) Yoder M-2½ Tube Mill installed by James Steel & Tube Co., Van Dyke, Mich. for making tubing sizes from ½" to 2½" o.d., incl.



Plain Facts about

ELECTRIC-WELD TUBE MANUFACTURE

In tube making everybody wants the highest possible speed consistent with good, strong welds and dimensional accuracy. There are, in addition, at least three more essentials to profitable tube making, namely:

1. Low scrap losses—because cost per foot of strip metal is many times greater than the conversion cost.
2. Fine exterior finish, free from scratches, scuff marks and other irregularities which limit usefulness and lower salability.
3. Quick and easy mounting and adjustment of tooling, to reduce time losses between successive production runs.

Yoder tube mills excel in all these respects and have other mechanical, electrical and economic advantages. Because Yoder tube mill owners have found from experience their performance is as good as our promise, there are more Yoder mills sold and in operation than all other electric-weld mills combined. This is as true today as it was ten years ago.

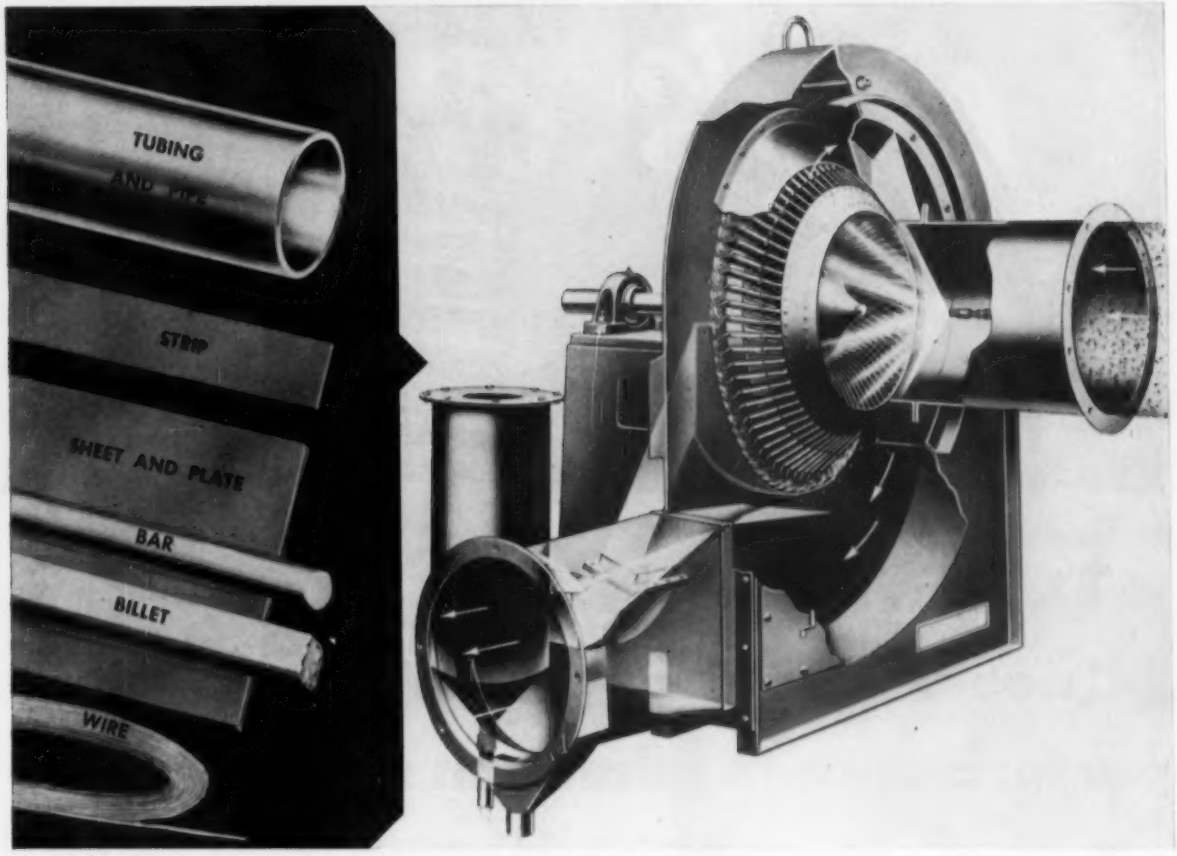
If you want the plain facts about the things to look for in a tube mill, to insure most profitable operation over the years, the new Yoder Tube Mill Book will give them to you, in the simplest language and with numerous illustrations.

A copy is yours for the asking.

THE YODER COMPANY
5510 Walworth Avenue, Cleveland 2, Ohio

ELECTRIC-WELD TUBE MILLS • SLITTING LINES
COLD ROLL FORMING PRODUCTION LINES

ENGINEERING YODER MANUFACTURING



WHEN SEVERE CORROSION IS YOUR PROBLEM . . .

use *Carpenter* Stainless No. 20 and No. 20Cb

TO S-T-R-E-T-C-H EQUIPMENT LIFE . . . CUT COSTS

The super corrosion resistance of Carpenter Stainless No. 20 and No. 20Cb to strong acids, pickling solutions, gases, and other severe corrosives is enabling a fast-growing number of processing plants and equipment manufacturers to greatly increase equipment life, reduce down-time for replacements, and lower corrosion control costs.

For instance, the unique dust handling unit, over 8 ft. high, shown above was made *entirely* of Carpenter Stainless No. 20 and No. 20Cb for a chemical company to provide long-life corrosion and abrasion resistance to dust and vapor containing sulphuric, nitric and hydrofluoric acids, and sodium aluminum sulphate.

These time-saving, cost-cutting super stainless alloys provide extraordinary resistance to sulphuric acid and are completely unaffected by a long list of other strong corrodents. They are available in the form of tubing, pipe, sheet, plate, bars, billets and wire.

For data on corrosion resistance, properties, performance results, uses, and fabrication of Carpenter Stainless No. 20 and No. 20Cb, ask for Bulletin 108A.

If you design, build, or use equipment that must withstand strong corrosive attacks, why take chances on getting satisfactory results with ordinary corrosion-resistant materials? Find out how Carpenter Stainless No. 20 and No. 20Cb can save you time, trouble and money . . . have your nearest Carpenter Distributor or Representative give you the full story.

MEMBER

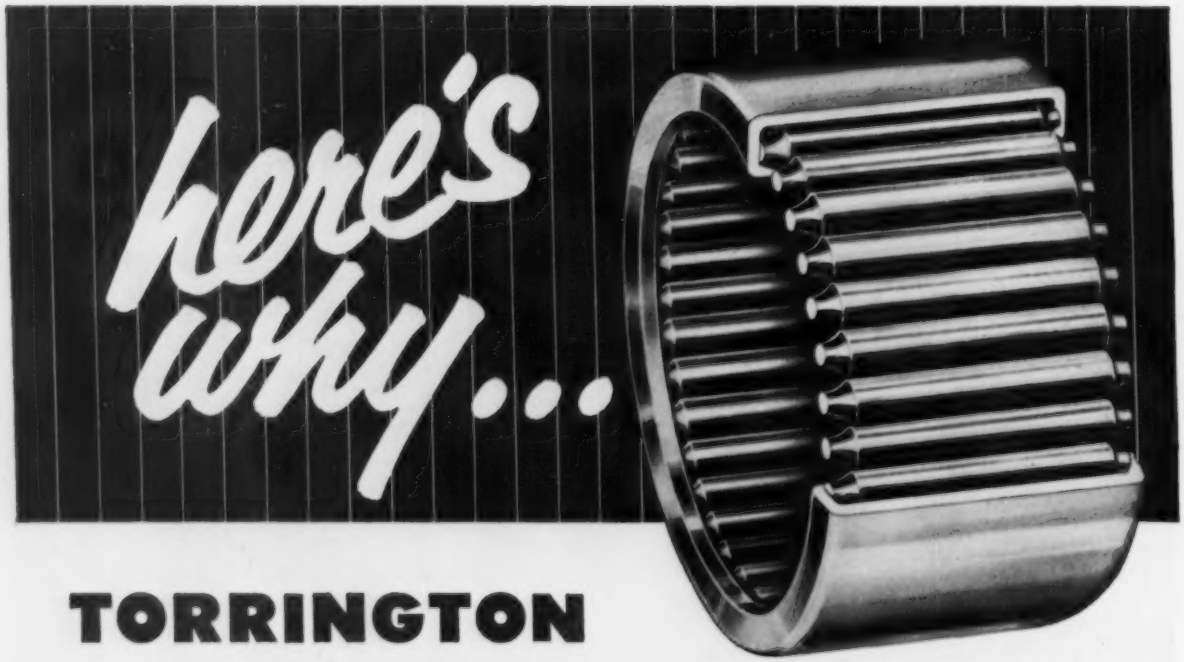
The Carpenter Steel Company,
Alloy Tube Division, Union, N. J.

Export Dept.: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Carpenter

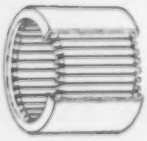
Stainless Tubing & Pipe

Carpenter No. 20 bars, strip, wire and billets are available also from The Carpenter Steel Company, Reading, Pa.

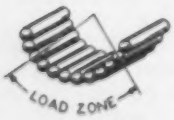


TORRINGTON

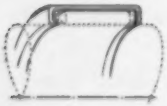
DC needle bearings give high-capacity performance in minimum space



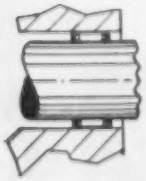
Unique construction—accurately drawn, surface-hardened shell retains rollers and serves as outer raceway.



Full complement of small diameter rollers—precision-ground and through-hardened—assures top capacity by distributing load over large number of contacts.



Turned-in lips of the case-hardened outer shell keep dirt and grit out, lubricants in—while retaining trunnion ends of rollers. All wear surfaces of outer race are case-hardened.



No inner race required on surface-hardened shafts—reduces space requirements, lowers unit costs.

Simple assembly—arbor press seats bearing in round housing bore. No collars, shoulders or retaining rings needed.

Closed end type DC Needle Bearings are available for stub shaft applications. The closed end provides a perfect seal at no extra cost.

Needle Bearings are made in a Precision Series for most applications and an Extra Precision Series where low radial play and minimum eccentricity are required. Easy lubrication through optional hole in shell or through hole in shaft assures long service life. Bearings can be pre-packed with suitable grease for those applications requiring grease lubrication.

See our new Needle Bearing Catalog in the 1955 Sweet's Product Design File—or write direct for Catalog No. 55.

THE TORRINGTON COMPANY
Torrington, Conn. **South Bend 21, Ind.**

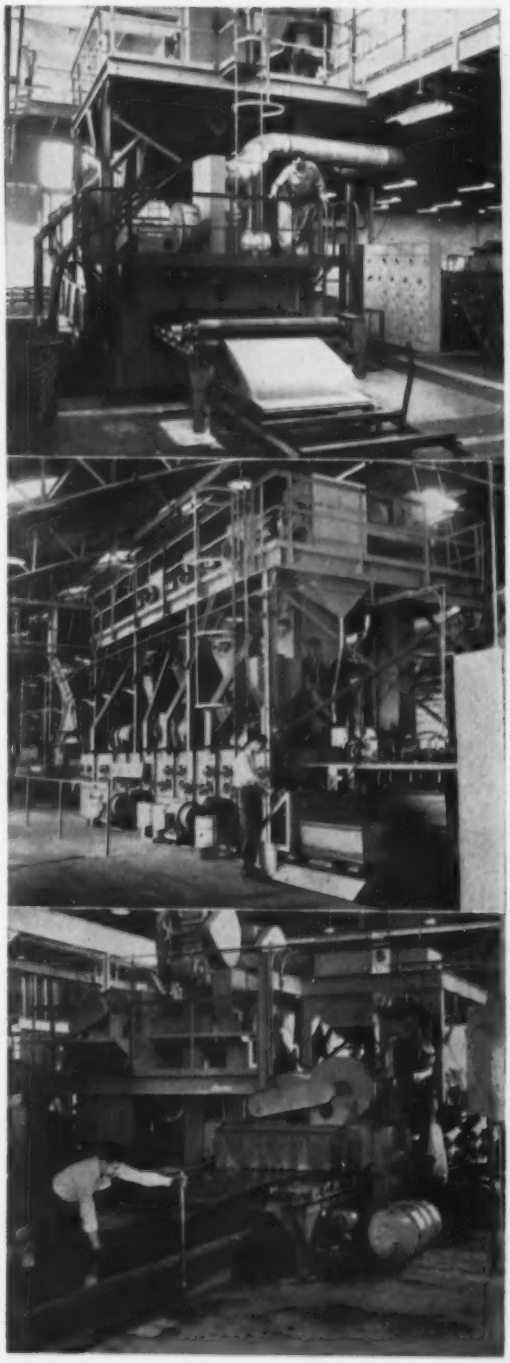
District offices and distributors in principal cities of United States and Canada

TORRINGTON NEEDLE BEARINGS

Needle • Spherical Roller • Tapered Roller • Cylindrical Roller • Ball • Needle Rollers

How to save on STEEL COSTS

DESCALE YOUR STEEL WITH AN AIRLESS WHEELABRATOR® LIKE . . .



- **A. O. SMITH CORP.**

  Sheet steel, formerly purchased pickled and oiled at a premium from the mill, now is descaled in a Wheelabrator airless blast cleaning cabinet at the Permaglas-Heating Division. Savings effected by mechanical descaling were sufficient to amortize investment within one year's time.

- **RHEEM MFG. CO.**

  Wheelabrator mechanical descaling reduced steel cleaning costs $3 to $4 per ton in seven "Rheemcote" lithographed steel drum manufacturing plants. The matte finish produced on the steel sheets also anchors the full-color lithographed finish in a permanent bond.

- **ATWOOD VACUUM MACHINE CO.**

  Wheelabrator mechanical descaling of steel sheet and coil stock, used in its production of automotive hardware, etc., has improved operations many ways for Atwood. Cleaning costs are considerably less than pickling. The matte finish of the Wheelabrated steel provides an excellent base for lubricant used for cold drawing and forming, and the steel draws readily and welds easily.

- **START THESE SAVINGS NOW**

  Wheelabrator mechanical descaling saves many dollars per ton compared to the purchase price of pickled stock. Start now to make worthwhile savings in your own operations. Write today for complete information.

World's largest builders of airless blast equipment

WHEELABRATOR
CORPORATION
(Formerly American Wheelabrator & Equipment Corp.)

510 S. Byrkit St., Mishawaka, Indiana

Trail Blazer of Industrial Progress

Has any Cold Drawn Finish ever "made good" so fast!

LUSTERIZED
TRADE-MARK
FINISH

IN FEBRUARY 1955, we shipped the *first* order of LUSTERIZED FINISH from our Harvey plant.

Now this premium product is available from *all* 4 B&L plants.

More than 70% ... of our total Cold Drawn tonnage is being shipped to customers who specify LUSTERIZED FINISH on their orders.

Smoother
CLEANER
BRIGHTER

LUSTERIZED* NON-LUSTERIZED

*Pat. Pend.

BLISS & LAUGHLIN, INC.

GENERAL OFFICES: HARVEY, ILLINOIS

SALES OFFICES IN ALL PRINCIPAL CITIES

FOUR PLANTS:—

HARVEY, ILL.

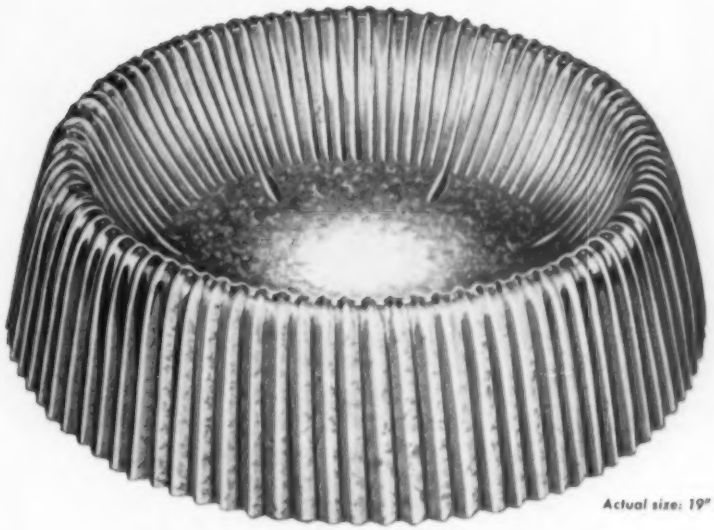
DETROIT, MICH.

BUFFALO, N. Y.

MANSFIELD, MASS.

A CHALLENGE:

THE STRONGEST MADE BY ANY GALVANIZED SHEET—



Actual size: 19" O. D.

Anything that can be made of steel sheets can be made of

WHEELING

SOFTITE®

galvanized sheets!

WITH a complicated reverse draw and tight corrugations, manufacturing this hog feeder *could* have been a problem. *But it wasn't.*

It is made of Wheeling SOFTITE, the galvanized sheet with the tightest zinc coating yet produced...so tight, in fact, that you can use it to make anything you can make of steel sheets.

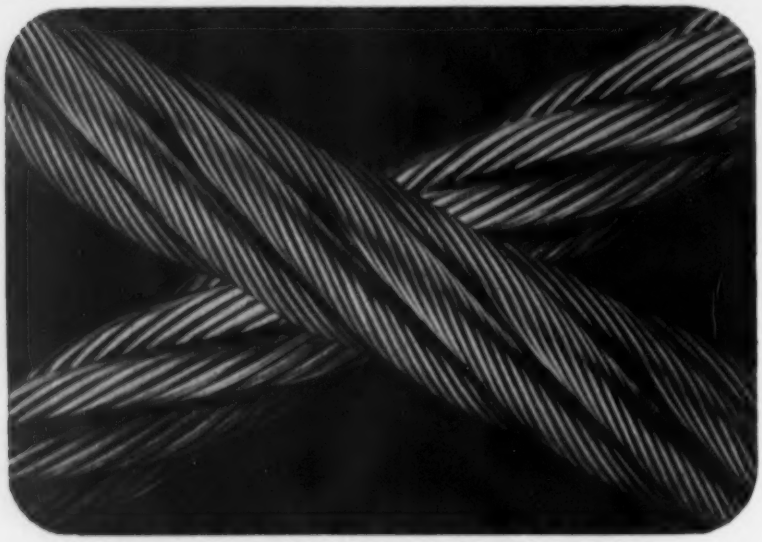
That's SOFTITE...*Wheeling* SOFTITE...made by the company that led with the development of COP-R-LOY, the original copper-bearing steel pipe and perfected DUCTILLITE, the original cold reduced tin plate which revolutionized the tin plate industry, and opened new fields to the can maker and packer. Now, because of the unprecedented demand for SOFTITE Galvanized Sheets, Wheeling has been forced to triple its production facilities in 1955.

IT'S WHEELING STEEL

DISTRICT SALES OFFICES—Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Detroit, Houston, New York, Philadelphia, St. Louis, San Francisco, Wheeling

FIRST CAME **COP-R-LOY**, THEN *Ductillite*, NOW WHEELING **SOFTITE**®

FIRST WE DEVELOPED 1105 ROPE WIRE.



THEN WE MADE ROEBLING'S

Royal Blue

WIRE 1105 ROPE

1105 takes Royal Blue out of the ordinary wire rope class.

1105 is a rope wire that's new—that's stronger. It's the biggest news in many years.

1105 is the result of more than a century of research and development—it's the wire that gives Roebling Royal Blue the stamina that pays off in service.

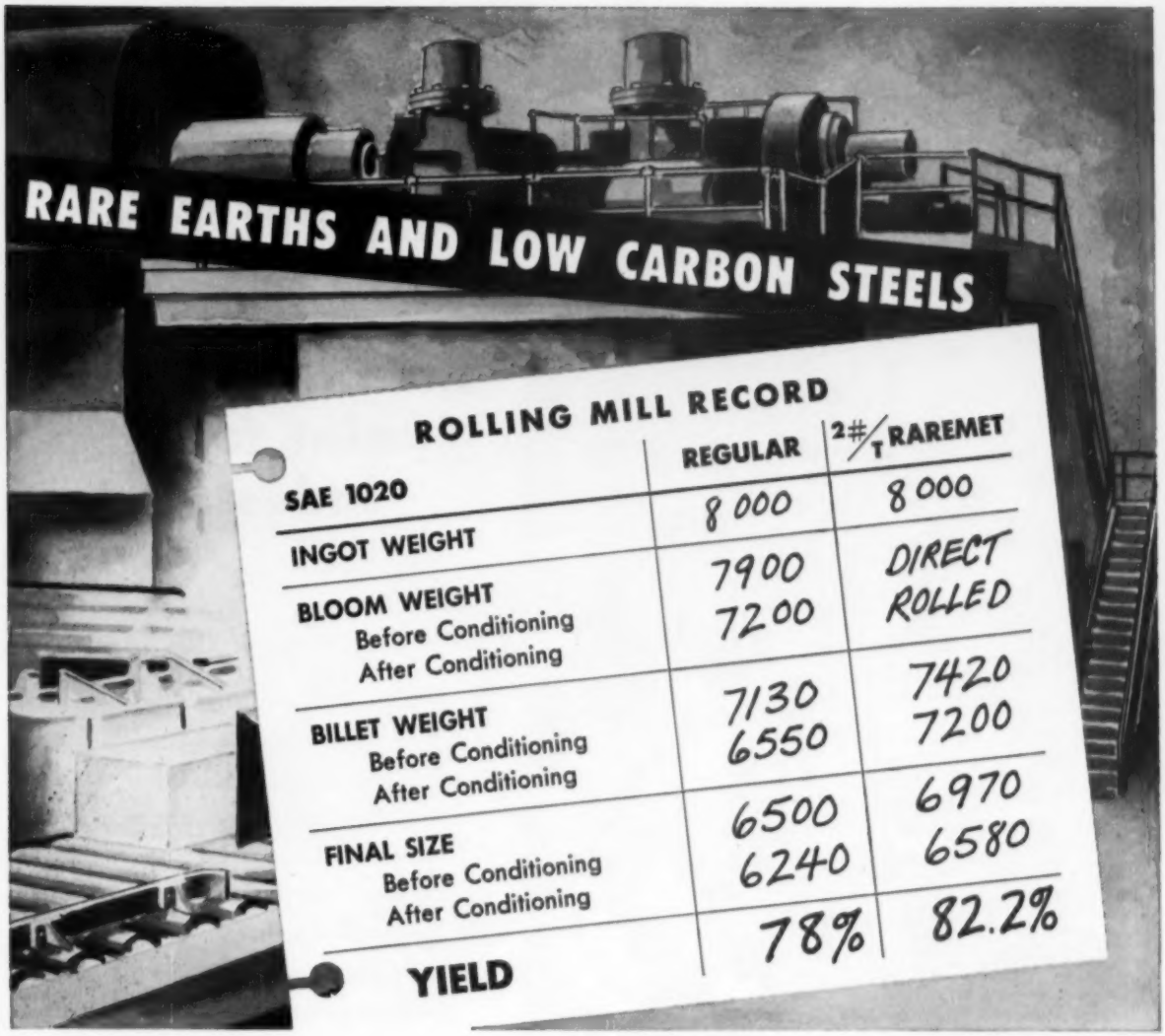
Contact your Roebling distributor or write us for the full story.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

CFI

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13235 LAKEWOOD HEIGHTS BLVD. • DENVER, 4201 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1930 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6, N. Y.



The troubles of producing low carbon steels have been mainly confined to rolling and surface preparation.

Since production economies are necessary, it's important to know what marked improvements have recently been obtained by Rare Earths in steel production. Minimizing blooming mill cracking, less conditioning time per ton, and increased yields are some of the results already proven. More than 200 production heats of low carbon steel show production savings which alert steel operators can use to advantage.

This recent progress further justifies economical rare earth additions for iron and steel. Commercially known as RareMeT Compound, it is conveniently packaged in ten pound containers.

Operating the world's largest rare earth deposits, Molybdenum Corporation of America welcomes requests for additional technical application data for specific problems. Complete and immediate response to inquiries is offered.

MOLYBDENUM

CORPORATION OF AMERICA

Grant Building **Pittsburgh 19, Pa.**

Offices: Pittsburgh, Chicago, Detroit, Los Angeles, New York, San Francisco
Sales Representatives: Edgar L. Fink, Detroit; Brumley-Donaldson Co., Los Angeles, San Francisco
Subsidiary: Cleveland Tungsten, Inc., Cleveland Plants: Washington, Pa., York, Pa.

MCA

To guarantee exact duplication of color, a sample of each batch is checked against your required color standard under controlled light conditions. Sunrise and high noon light conditions can be produced by the lamp shown above, day or night. Further checks on color employ an electronic color difference meter.

24 HOUR SUNLIGHT

means better paint for industry

Developing *the right paint for your product or plant* is only the first step in the complete Lowe Brothers Technical Service.

Highly skilled technicians also perfect production techniques and supervise their control to guarantee that every mix of your formula is exactly the same and meets your rigid specifications.

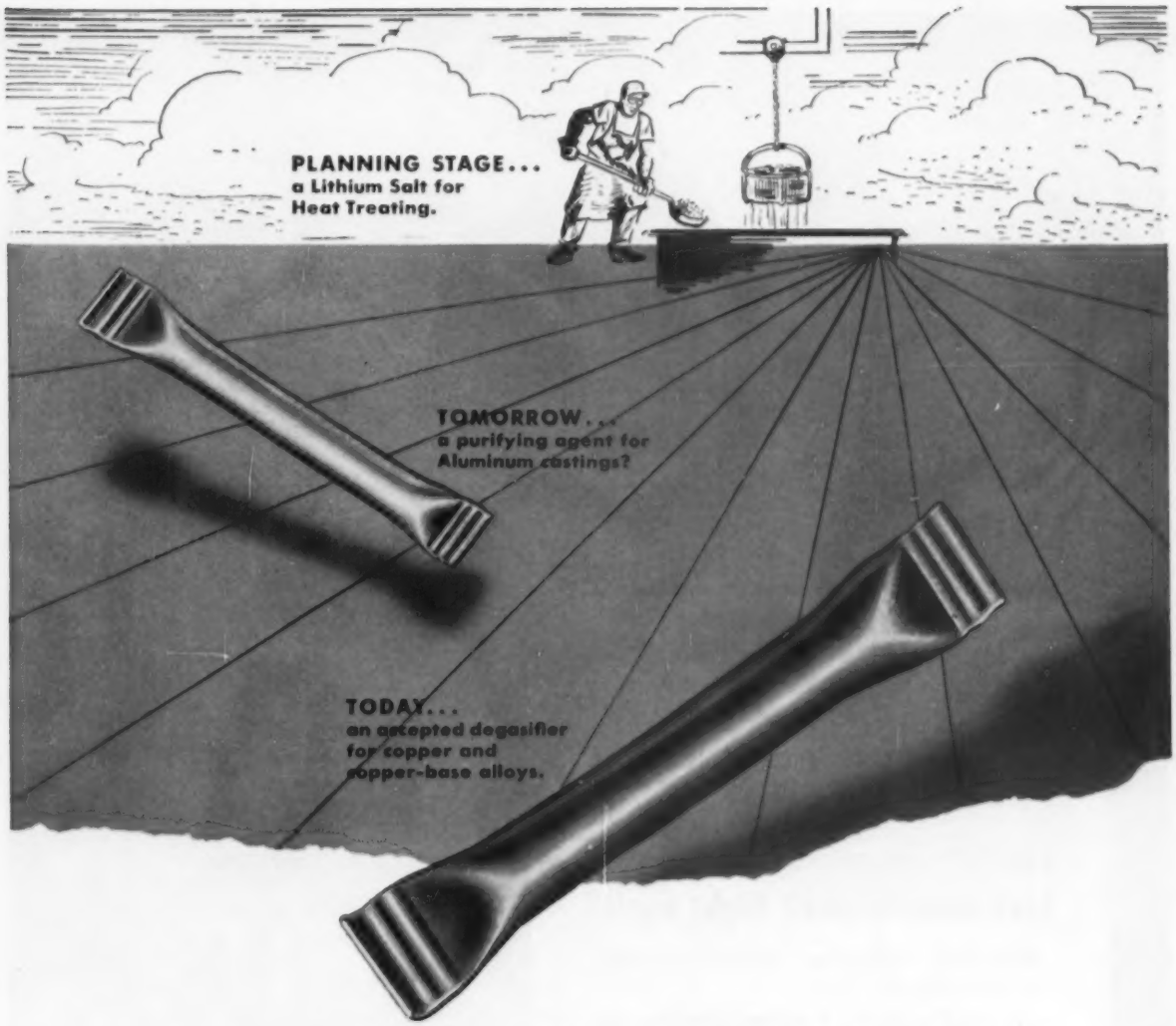
To control this production the very best testing equipment, such as the standard-light condition unit shown here, are utilized at every step during manufacture. As many as 89 separate production tests are standard for some paints.

This combination of technical "know how" and "production ability" assures you of the right paint for the best job every time. For this complete service call in your finishing specialist at LOWE BROTHERS, 434 East Third Street, Dayton 2, Ohio.

LOWE BROTHERS

INDUSTRIAL FINISHES

Quality unsurpassed since 1870



LITHIUM METALLURGY

Lithium has been long established in the nonferrous foundry industry as a degasifier, deoxidizer, desulfurizer and general purifying agent, particularly for high conductivity copper castings and copper-base alloys. The small amounts required put both the economics and technique within the limits of everyday nonferrous foundry operation. Research now under way suggests that Lithium is equally valuable as a degasifier for aluminum castings. Further extensive research on various Lithium Salts holds vast promise of valuable benefits to be gained for low temperature heat treating baths. Why don't you look into this miracle element? This revolutionary technique is within *your* reach. Write for details.

...trends ahead in industrial applications for Lithium

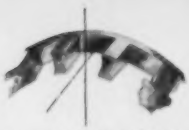
LCA LITHIUM CORPORATION OF AMERICA, INC.
2630 RAND TOWER
MINNEAPOLIS 2, MINN.

MINES: Keystone, Custer, Hill City, South Dakota • Bessemer City, North Carolina • Cat Lake, Manitoba • Amos Area, Quebec • BRANCH SALES OFFICES: New York • Chicago
CHEMICAL PLANTS: St. Louis Park, Minnesota • Bessemer City, North Carolina • RESEARCH LABORATORY: St. Louis Park, Minnesota

right from every angle . . .

RIGHT ANGLE
Roller
Ends

RIGHT ANGLE
Bearing
Surfaces



RIGHT ANGLE
Separator
Slots

Longer operating life? Right!
Less maintenance? Right again!

Heavy-duty equipment "rolls right" with Rollways because . . .

. . . solid cylindrical rollers provide the long line-contact required by heavy loads.

. . . precisely made ends, bearing surfaces and retainer slots restrict end-rub, skew and side-shock.

. . . special alloys in the races resist spalling and brinelling.

It all adds up to a bearing that rolls longer, takes less maintenance, prolongs the life of your equipment.

ROLLWAY BEARING CO., Inc.

553 SEYMOUR STREET • SYRACUSE, N. Y.

• Let our engineers help you select the Rollway bearing that's exactly right for your application. No charge —no obligation.

ROLLWAY
BEARINGS

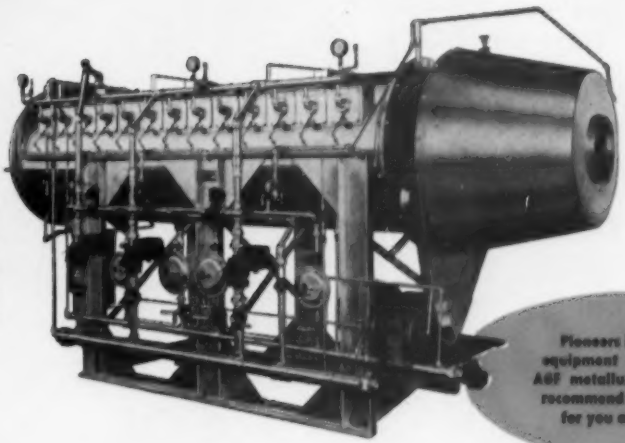
Complete Line of Radial and Thrust Cylindrical Roller Bearings

SALES OFFICES: Boston • Chicago • Cleveland • Detroit • Houston • Los Angeles • Philadelphia • Pittsburgh • San Francisco • Seattle • Syracuse • Milwaukee • Toronto

Controlled Atmosphere Heat Treating at the Lowest Unit Cost

Use this continuous production furnace without modification for general and atmosphere work, including "Ni-Carb" ammonia-gas carburizing. Gentle tumbling action mixes the work and assures uniform heat treating.

Improved AGF Continuous Rotary Retort Furnaces



Pioneers in heat treating equipment for 77 years. Ask AGF metallurgical engineers to recommend proper equipment for you at no obligation.

Here are some of the many engineering improvements AGF Pioneers have made so that you can produce more pounds of work for every dollar invested in an AGF continuous rotary retort furnace. Less maintenance and operational cost than with any other furnace.

- **Automatic self-metering feed hopper reduces work handling costs.**
- **Better control of processing atmosphere and temperature.**
- **Improved high production capacity combustion system.**
- **Increased thermal efficiency because only the work enters and leaves the furnace. Baskets, trays, chains and other troublesome mechanisms are eliminated.**
- **Alloy life is increased because the alloy remains within the furnace heating chamber at all times.**

Sizes in production capacities up to 800 pounds per hour.
Representatives in principal cities.

AMERICAN GAS FURNACE CO.
1004 LAFAYETTE STREET
ELIZABETH 4, N. J.

Send me your Bulletin No. 870 which will help me produce a quality product at lowest cost.

NAME.....TITLE.....

COMPANY.....

ADDRESS.....

NO SINGLE WELDER WILL DO IT ALL!

THERE'S EXACTLY
THE RIGHT **miller** WELDER
TO MEET EVERY WELDING REQUIREMENT

MILLER SR RECTIFIER TYPE DC ARC WELDERS

Available in 200, 300, 400 and 600 amperes, it is a superior direct current welder using Miller Unitran transformer control and selenium rectifiers for conversion from 3 phase AC line current. Miller SR Welders feature widest possible current range, extreme arc flexibility, maximum electrode deposition rate and highest electrical efficiency.

THE *New* MILLER SRH RECTIFIER TYPE DC ARC WELDER

A new concept in welder design for all DC metalic arc welding. Available in 200, 300 and 400 amperes. It is ruggedly constructed, compact, and is designed to lend itself to stacking for parallel operation or to conserve floor space. It has single range control and is weatherproof.

MILLER ARC WELDERS FOR TUNGSTEN ARC WELDING PROCESS

These Miller Welders feature the patented Miller UNITRAN control circuit which combines the transformer with its own integral flux diverter. This, in conjunction with adequate open circuit voltage, high frequency, balancing resistor and optional controls insures superior uniformity and flexibility throughout the entire welding range. Available in nine models.

THE *New* MILLER MULTI ARC COMBINATION AC-DC WELDER

Available in 14 models, this new Miller Welder provides both AC and DC welding power for applications where both are required. It operates from a single phase power line and is available with high frequency and controls designed especially for inert gas arc and spot welding.

MILLER 100 SERIES HEAVY DUTY INDUSTRIAL TYPE AC WELDERS

Designed for heavy production welding and automatic welding applications. Available in eight models. The 100 Series Welders permit faster welding—as much as 35% faster. Movable coil design and 80 volts O.C.V. produces uniform and better welding characteristics throughout the entire range of the welder.

Write today for complete information on these Miller Welders.

ARC · SPOT **miller** GENERATOR WELDERS

miller

ELECTRIC MANUFACTURING CO., INC.
P.O. Box 798 Appleton, Wisconsin

"... if it's MILLER you know it's the finest..."

HOW TO BUY RUBBER TRANSMISSION BELT

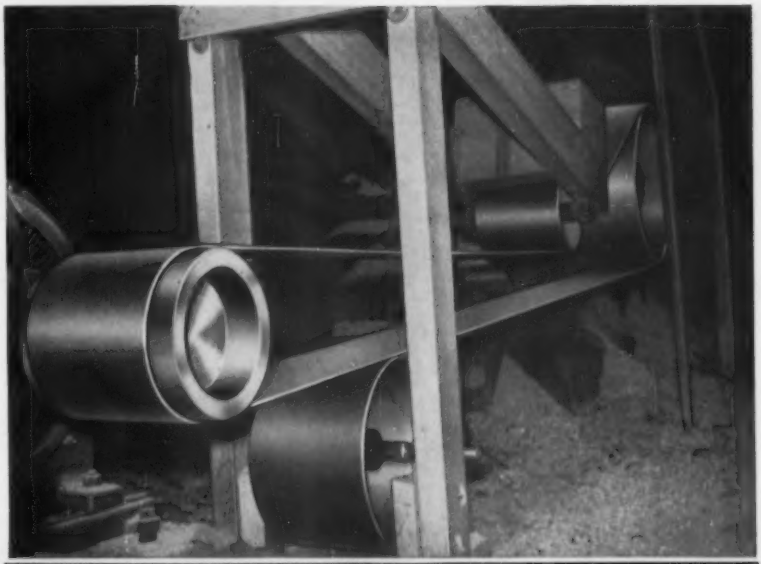
For MORE POWER AND LONGER BELT LIFE

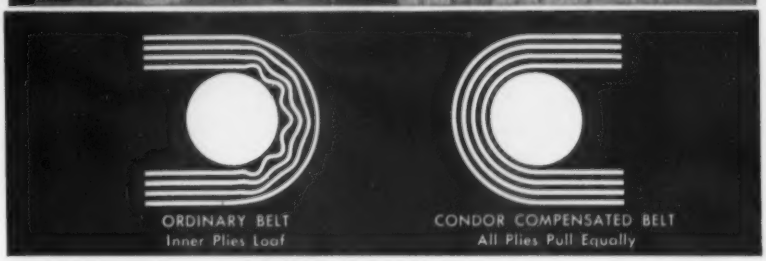
"More Use per Dollar"

Look for a belt engineered to give uniform ply tension and eliminate major causes of premature belt failure.

Unequal distribution of tension among the plies of a rubber transmission belt is the cause of most belt weaknesses and eventual failure. With ordinary belts, the inner plies "loaf", become loosely crumpled when rounding a pulley. Outer plies become overworked . . . pull more than their share of the load. The thicker the belt the greater the tension of these outer plies. It is here where belt failures begin . . . plies separate, outside plies rupture—especially at the fasteners. Where ply stresses are equalized *during manufacture*, every ply pulls its share of the rated horse-power of the belt . . . you get more power, more belt life, longer trouble-free service.

Specify by name the only transmission belt with exclusive equalized ply stresses . . . specify R/M's Condor Compensated Belt.





CONDOR COMPENSATED BELT

An exclusive Manhattan method of equalizing transmission belt ply stresses was developed by R/M engineers especially to eliminate ply separation, rupture and fastener troubles. When Condor Compensated Belt rounds the pulley, every ply is under *uniform* tension . . . every ply pulls its full share of the load. On many drives, Condor Compensated Belt holds fasteners up to 4 times longer than ordinary belt. A selection of driving surfaces is available to meet various machine tension requirements . . . from low-tension to a required degree of slip.

Let an R/M representative show you how the advantages of Condor Compensated Belt can mean more power and longer trouble-free belt life . . . "More Use per Dollar" on your power transmission drives. For endless belts, ask about Condor Whipcord Belts with endless, stretchless cord strength members.

RM 516 F & L

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings
Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Bowling Balls

Here the all-hydraulic Hydrocrane, equipped with magnet, handles a load of scrap. By telescoping boom in and out, load can be positioned without moving crane an inch — particularly valuable in close quarters that restrict hoisting or lowering boom. Note how high the boom is mounted on "A" frame. You can set boom parallel to ground and poke the nose straight in and out of the spot where you're loading.

Hydrocrane Changes Boom Length While It Works–

noses materials out where equipment can't move in

A boom with an 8-ft. telescoping section that can slide in and out hydraulically *while crane is working* — that's the move-it-faster feature you get with a Bucyrus-Erie Hydrocrane. Telescoping section extends or retracts *either while boom is stationary or during boom hoist or line hoist.* With this outstanding feature, operators have nosed boom into windows and boxcars, over walls, between wires — quickly moving castings, machinery, bulk material, scrap metal, etc.

Compact Hydrocrane — a "Squeeze-In" Specialist

Extremely short tail swing (about 4½ ft.), low over-all height and independent boom hoist plus boom telescope permit almost unbelievable maneuverability on erecting, digging, and material spotting jobs.

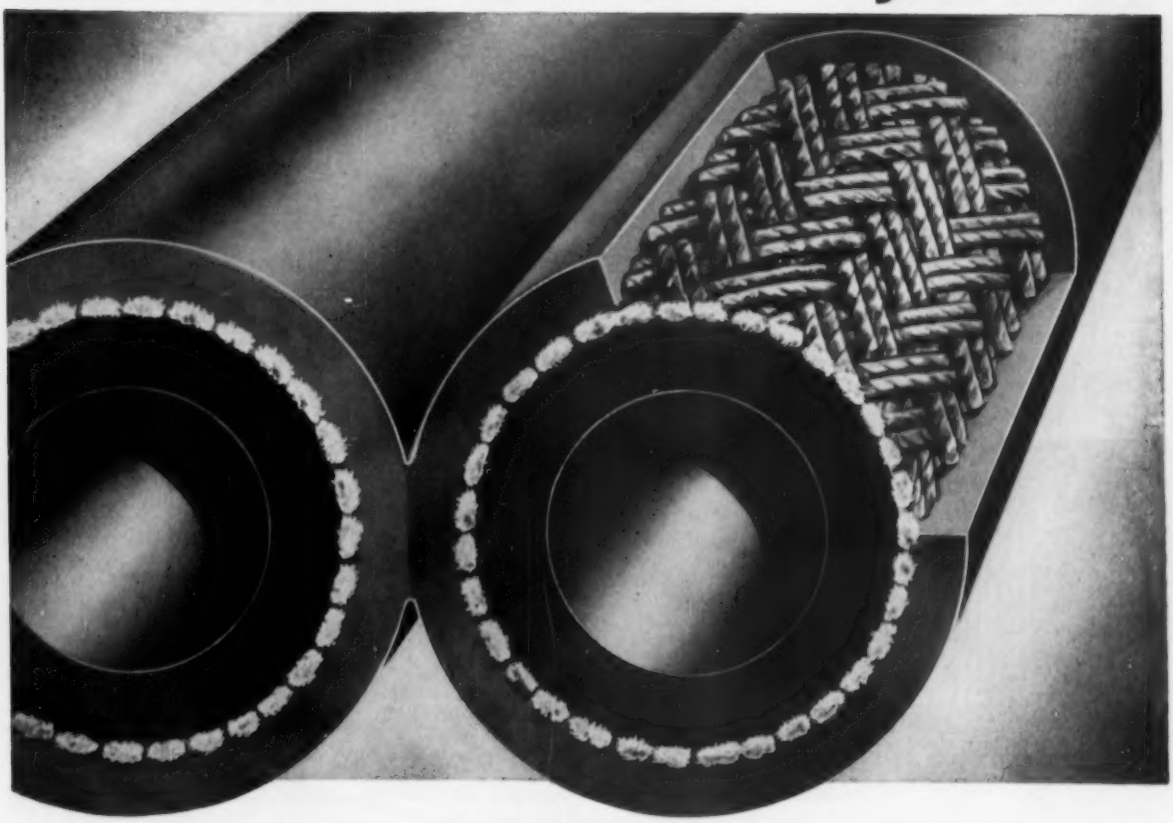
Make the "Reach" Test Right on Your Job

Find out exactly how the telescoping boom can speed your material handling jobs — indoors and out. Arrange for a demonstration with your Bucyrus-Erie distributor. Write us for new Hydrocrane literature on remote control, self-power, double-acting clamshell and interchangeable dragshovel front end. 96HSS

BUCYRUS ERIE
South Milwaukee Wisconsin

1880 75 1955
YEARS OF SERVICE
to Men Who Shape the Earth

TWIN-WELD . . . Now Four Ways Better



Hewitt-Robins Twin-Weld Hose Offers Values Found in No Other Welding Hose

Twin-Weld® — the original twin-line welding hose, preferred by over 7 out of 10 users — is now four ways better.

Twin-Weld is non-porous . . . it eliminates welding inefficiency, explosions and fires.

Twin-Weld has a greater ease of handling . . . eliminates tangling, assures flexibility. Twin-Weld has the important advantage of being a "straight-cure" hose; it won't snake.

Twin-Weld eliminates tangled lines. Its two lines are firmly bonded together, yet easily separated by cutting with a knife.

Twin-Weld Hose incorporates principles of construction and methods of manufacture which are exclusive with Hewitt-Robins. It is safer, longer-lasting and now has a new neoprene flame-resistant cover.

O.D.'s now conform to IAA specifications — 7/16", 17/32", 19/32" . . . I.D.'s 3/16", ¼", 5/16".

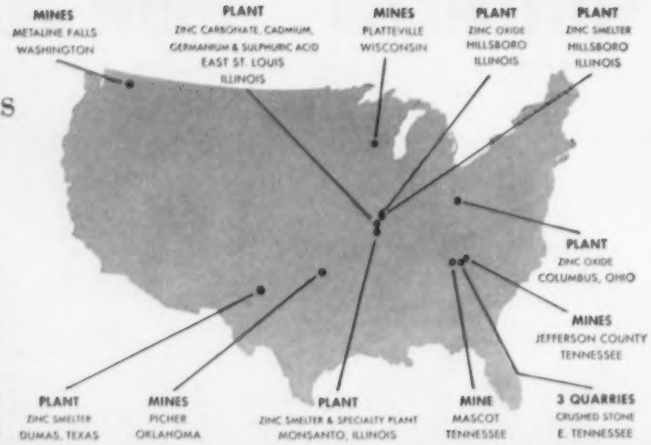
Get the facts about Hewitt-Robins Twin-Weld Hose. Write for Bulletin No. H-4a. Or contact your local Hewitt Rubber Distributor (see "Rubber Products" Classified Phone Book).

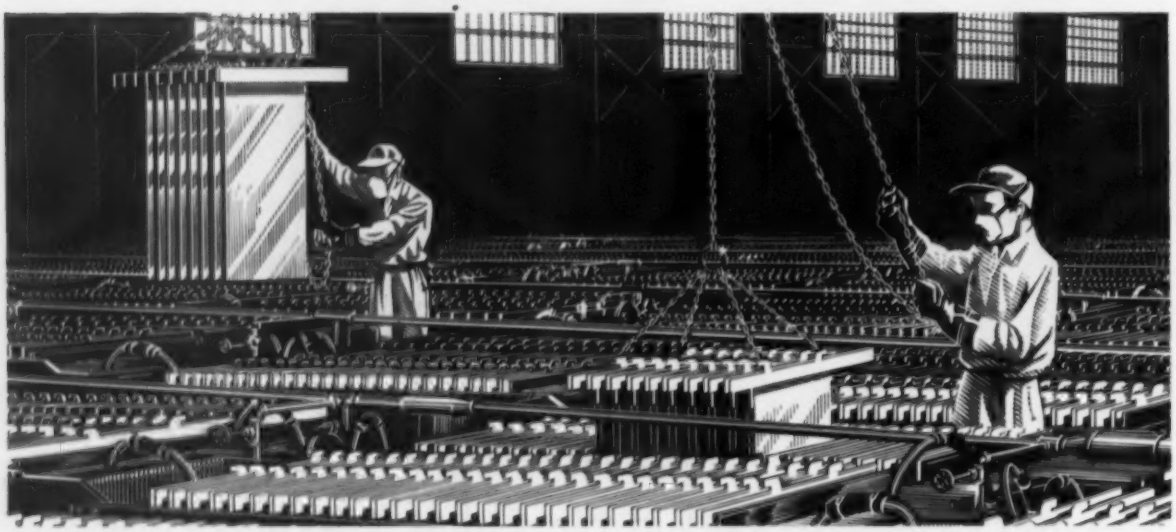
Hewitt-Robins

Conveyor Belting—Conveyor Machinery—Industrial Hose—Vibrating Screens—Vibrating Conveyors—Design, Manufacture, Engineering and Erection of Complete Bulk Materials Handling Systems.

HEWITT-ROBINS INCORPORATED • STAMFORD, CONNECTICUT

American Zinc and its products *from* A *to* Z





OPERATIONS AT MONSANTO, ILLINOIS

Modern and recently expanded electrolytic plant producing special high grade slab zinc, which is sold primarily to the die casting and brass manufacturing industries. In conjunction is a specialty plant for the production of zinc ball anodes, heavy plating anodes and anodes for cathodic protection. For complete picture of American Zinc operations, see map above.

PRODUCERS OF

ALL GRADES OF SLAB ZINC
ZINC ANODES (Plating & Galvanic)
METALLIC CADMIUM
SULPHURIC ACID
LEAD-FREE and LEADED ZINC OXIDES
ZINC CARBONATE
GERMANIUM DIOXIDE
AGRICULTURAL LIMESTONE
CRUSHED STONE

Distributors for

American Zinc sales Company

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, Ohio • Chicago • St. Louis • New York • Detroit • Pittsburgh

The Iron Age Newsfront

Warehousemen Look For Boom Year

The steel warehouse industry has its sights set on a next-to-the-best sales year. Volume-wise, sales are expected to be up 30 to 40 pct over last year and close to the peak of '53. Reasons: Tighter mills schedules, lower consumer inventories and good economic climate. It is generally conceded, too, that shipments of finished steel to warehouses will set a record at 15 million net tons or 18 pct of total output. Top shipment year to date was 1953 when 13.1 million net tons of finished steel went to warehouses.

Boost Openhearth Output?

Superheated, desiliconized wash metal promises to substantially increase present openhearth furnace output. Wash metal at 2950°F speeds the melting cycle and boosts oxidizing and refining reactions. Estimated production increases claimed for the process range from 25 pct with 50 pct wash metal to a 50 pct increase with 70 pct wash metal.

Nuclear Power Plant Prospects

Full scale, permanent power stations run by nuclear energy are about two years away, the Atomic Energy Commission figures. Some technical problems, such as fuel element production and chemical processing are still to be solved. But industry will spend more than $300 million to install plants that can extract 1 million kw of electric power from the atom soon after 1960.

Soft Pedal Auto Safety

The current emphasis on safety devices in the 1956 cars has one auto manufacturer concerned about the whole program boomeranging on the industry. The company is going to include safety features on its cars but is going to soft pedal them as much as possible.

Ore Supplies Dropping

What several months ago was considered to be ample supplies of iron ore at the lower Lake ports is not so today. Current consumption is heavy in an effort to take the pressure off the scrap market just at the end of the shipping season.

See New Seaway Benefits

There is a noticeable change in philosophy on benefits that the St. Lawrence Seaway brings Great Lakes cities. Some will actually lose transshipment business, now rely on new industry based on the attraction of cheap power and low transportation costs. At the same time railroads now believe that lucrative new business can be had in transporting to and from new ports, are making plans to build profitable dock and warehouse facilities.

Magnesium Castings for Volkswagen

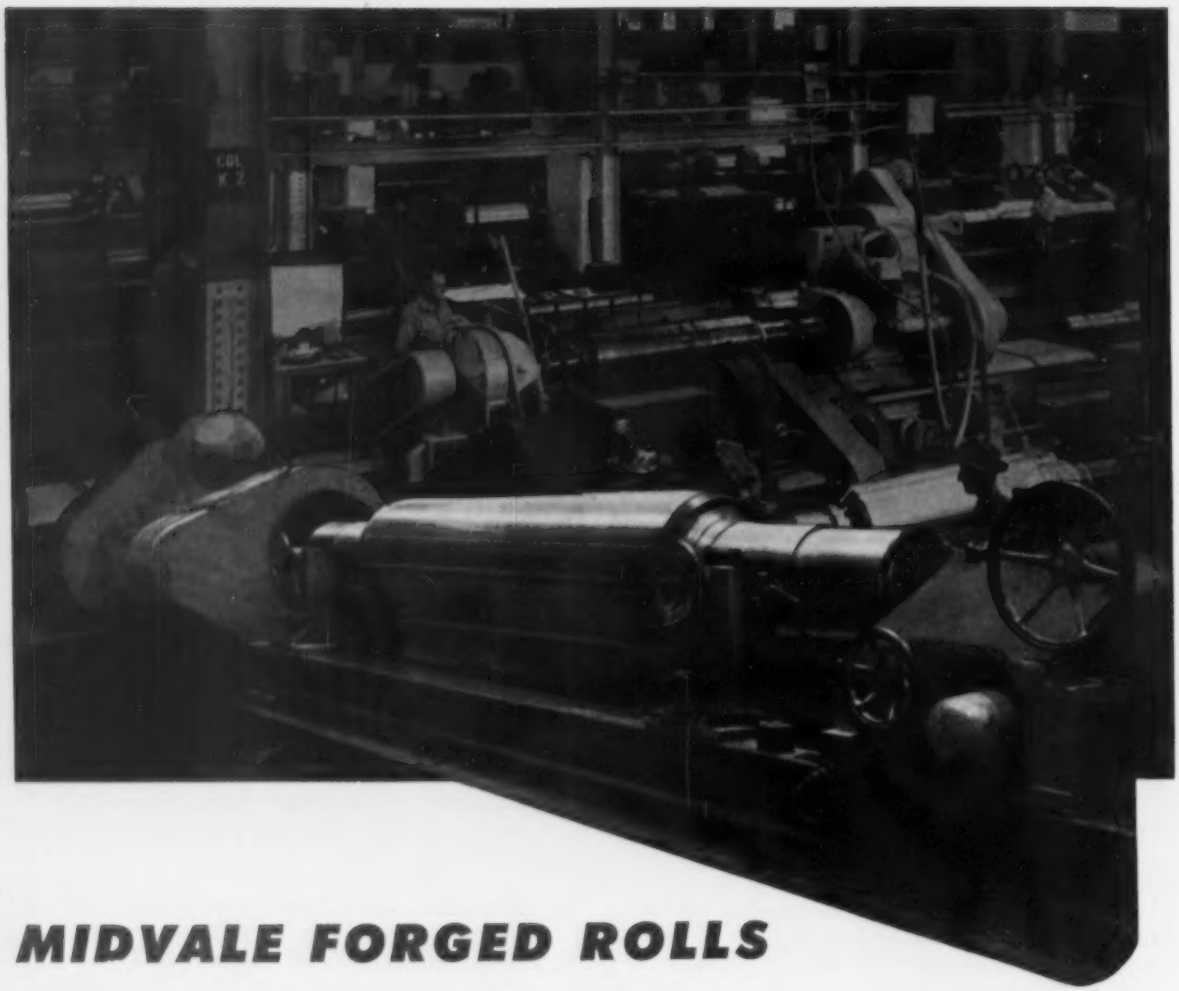
There's been much speculation as to how much actual manufacturing of parts for the Volkswagen would be done in this country. This has been the big question mark since the firm announced plans for its new assembly plant in New Jersey. Some reliable industry executives now believe that the German firm will soon announce that 10 magnesium parts for the car will be cast in this country.

Search Leads To Extra Savings

Savings resulting from new machine tool installations are often so impressive that often cost-reduction drives stop right there. One firm mass producing parts kept right on looking and found new savings in more efficient parts handling. Then the metallurgists got into the act by proposing use of less expensive raw material—surpassing the required physical properties by improved heat treating methods.

Induction Heating Pays

A dollar-and-cents guide to the economical use of induction heating is now a matter of record. Assuming that power can be had for 1¢ per kw hr, Canadian steel operators figure that induction heating becomes profitable when combined costs of fuel, labor and overhead exceed $4 per ton of steel on a fuel-fired operation.



MIDVALE FORGED ROLLS

TOUGH ROLLS TO BEAT AT THE FINISH

From the furnace to finished grind Midvale Forged Steel Rolls are made with greater durability to provide a finer finish for longer runs.

Half a century of roll making experience skillfully shapes rolls under the right size press for the particular roll . . . produces the maximum in grain refinement. Careful heat treatment gives them the required surface hardness, up to 105 Shore, and endurance qualities underneath. A series of inspections, including sonic testing, approve it for service.

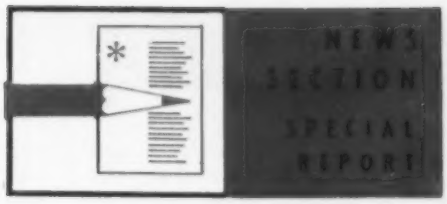
Do you need high quality, longer lasting forged rolls in your mill? Whether they are for strip or sheet mills . . . precision rolling of copper, aluminum or other metals, let Midvale roll specialists show you why you can be sure of a good finish when you start with Midvale Forged Steel Rolls.

THE MIDVALE COMPANY- Nicetown, Philadelphia 40, Pa.

Offices: New York, Chicago, Pittsburgh, Washington, Cleveland, San Francisco

MIDVALE

FORGINGS, ROLLS, RINGS, CORROSION AND HEAT RESISTING CASTINGS



METALWORKING: Delaware Valley Booms

Area has long offered market, transportation advantages . . . But industrial push set development in motion . . . Metalworking firms lead broad advance with heavy expansion programs—By *G. J. McManus.*

◆ ARRIVAL of the Metals Show in Philadelphia Oct. 17 is nothing if not timely. The city, with neighboring Delaware Valley counties, is enjoying a metalworking boom that jams ages of normal development into one high-speed decade.

Since 1945, the 11-county area running from the Atlantic 135 miles up the Delaware has seen upwards of $1.5 billion spent on new and improved metalworking facilities. Earnings of metal products workers have jumped 25 pct in the last 3 years; there has been a 23 pct increase in the number of workers.

Why the sudden build-up? A very neat explanation can be built from market, transportation and supply statistics. Within a 100 mile radius of Philadelphia there are 22 million people—14 pct of the nation—with buying power of $38 million—16 pct of the nation's total.

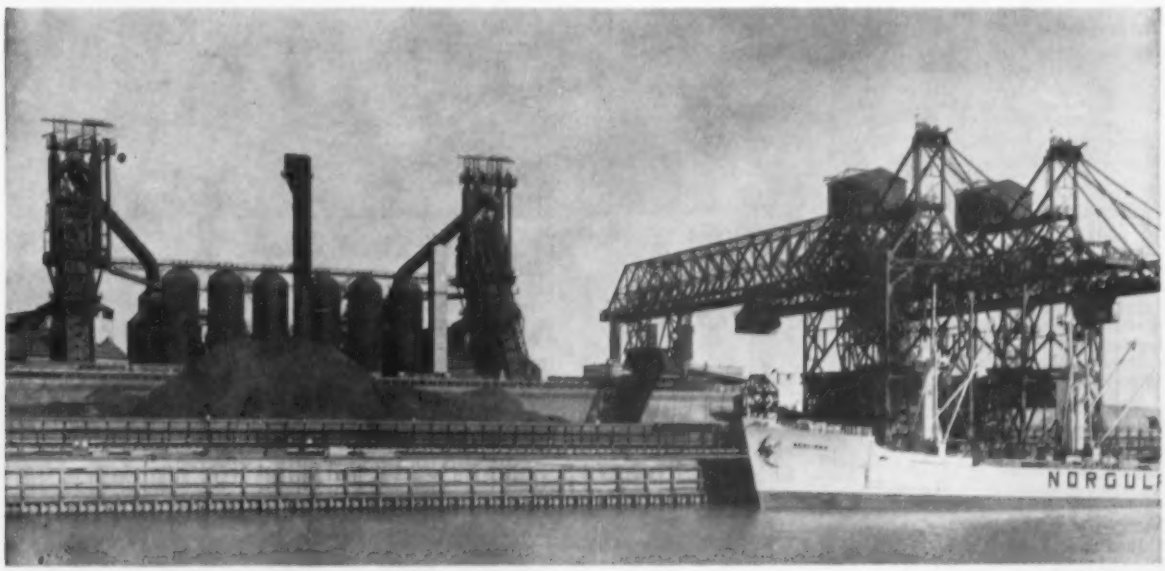
The region is served by three trunk line railroads: the Pennsylvania; the Reading; and the Baltimore and Ohio. More than 1000 truckers haul in and out of the area. The Delaware River Port offers 115 miles of sea level channel with 18 million sq ft of deck space and 190,000 ft of berthing room.

Bethlehem Steel stands on the rim of the Valley with an annual capacity of close to 10 million ingot tons. U. S. Steel's Fairless Works adds another 2.2 million tons. Other producers round out a handy, balanced steel supply situation.

These and other figures are impressive. They point up the potential of the Delaware Valley but they don't explain how this potential was realized. To understand what's been happening in the Valley, you have to follow a dynamic process that cuts across, changes and charges all the basic elements.

Wide Expansion

Taking just one aspect, industrial expansion brought a 10-year increase in Philadelphia Electric Co. commercial-industrial sales of



ORE CARGO is unloaded at U. S. Steel's Fairless Works near Morrisville, Pa. Over 4 million tons came in last year, but much of it had to be unloaded in deeper water and hauled overland. Rumored expansion at Fairless would cost $160 million, raise capacity to over 3 million tons. Present ingot capacity is 2.2 million tons.

2.199 billion kwh. Moreover, new and enlarged facilities drew people and builders to the area.

The 4000-home Fairless Hills development sprung up with U. S. Steel encouragement. The 16,000-home Levittown came into being in the same Bucks County area. These and other projects contributed to an increase in Philadelphia Electric's residential sales of 1.154 billion kwh since the war.

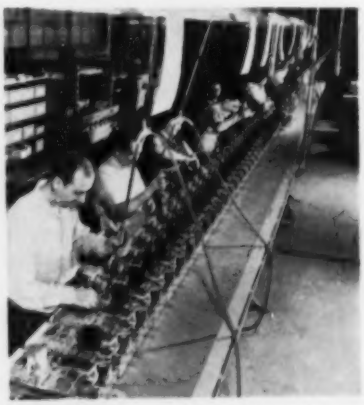
To meet added demands, the electric company expanded its facilities at the rate of more than $1 million a week. Since 1945, the company has sunk more than $453 million in new equipment and buildings. By 1960, the figure will be something like $765 million.

Local Supply

Equipment for this expansion has come in part from local suppliers. General Electric, Westinghouse and others have contributed to the district's growing power establishment.

GE, through its Philadelphia switch gear plant, provides high-power circuit breakers. To stay ahead of ever-increasing requirements and "to prove they were right," GE recently put up a $13 million laboratory in Philadelphia.

And to build the big breakers, GE has called on Lukens Steel at Coatesville, Pa., for giant housing components.



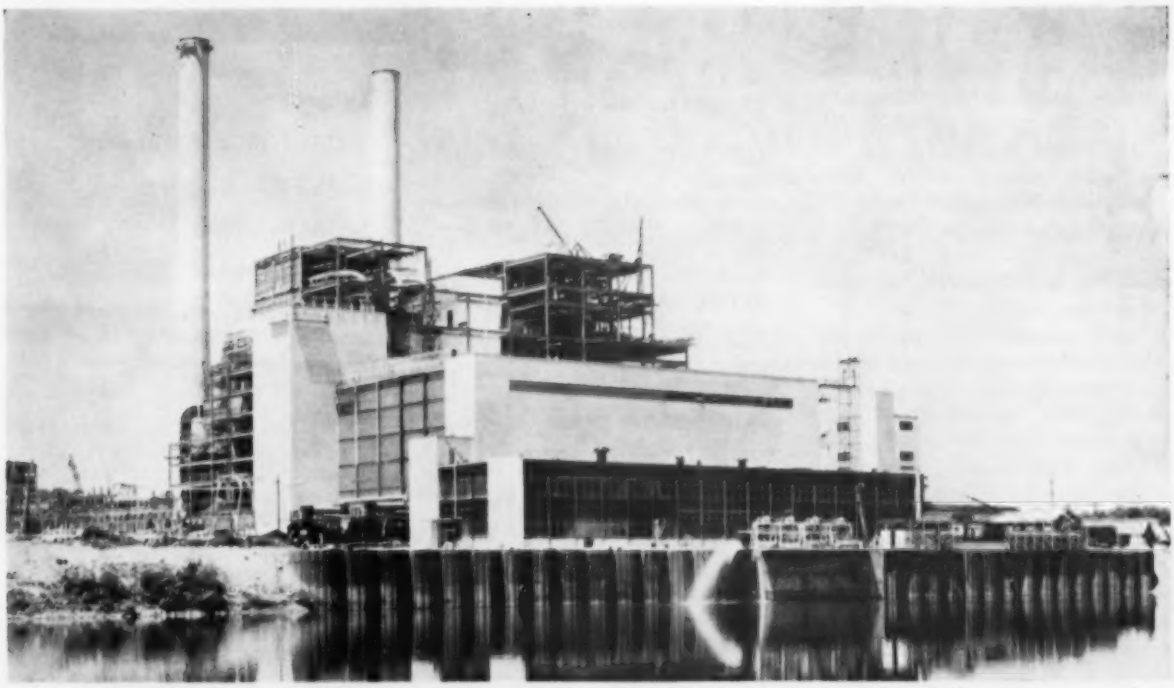
TV CHASSIS move down production line at Philco Television plant, Philadelphia. Philco employs 18,000 in Delaware Valley, where 200,000 new television receivers were sold in '54.

Where the Boom Brought

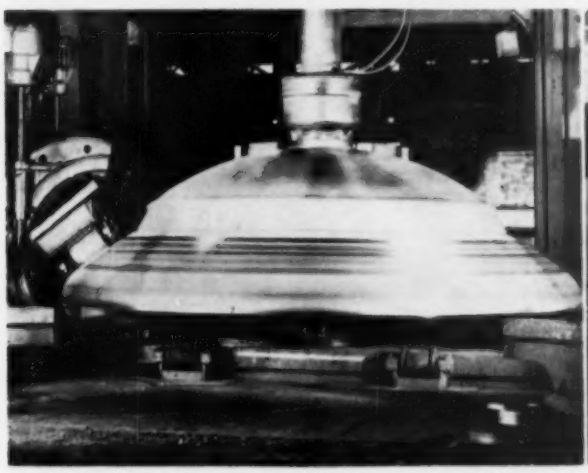
Delaware Valley Metalworking

	*Number of Workers in Plants over 20	*No. of Plants over 20 Workers
PRIMARY METALS	37,755	127
Blast Furnaces, Steel Works and Rolling Mills	18,916	6
Iron and Steel Foundries	6,065	40
Smelting & Refining of Nonferrous Metals	336	3
Rolling, Drawing & Alloying Nonferrous Metals	1,084	5
Nonferrous Foundries	3,822	18
Misc. Primary Metal	7,532	30
FABRICATED METAL PRODUCTS	51,950	73
Tin Cans & Tinware	2,050	3
Cutlery, Hand Tools & Hardware	8,758	28
Heating Apparatus (Except Elec.) & Plumbers Supplies	3,445	27
Fabricated Structural Products	13,732	119
Metal Stamping & Coating	17,012	51
Lighting Fixtures	1,333	18
Fabricated Wire Products	1,644	22
Misc. Fabricated Metal Products	4,205	43
MACHINERY (EXCEPT ELECTRICAL)	46,092	255
Engines & Turbines	9,485	16
Agricultural Machinery & Tractors	121	2
Construction & Mining Equipment	799	5
Metalworking Machinery	3,381	36
Special-Industry Machinery	7,972	68
General Industrial Machinery & Equipment	7,624	53
Office & Store Machines	1,175	9
Service-Industry & Household Machines	6,730	21
Misc. Machinery Parts	8,002	59
ELECTRICAL MACHINERY & EQUIPMENT	36,555	71
Elec. Generating Transmission & Industrial Equipment	9,692	30
Electrical Appliances (Not Elsewhere Classified)	830	6
Insulated Wire & Cable	2,066	3
Electrical Equipment for Transportation Equipment	377	2
Electric Lamps (Bulbs, etc.)	1,289	2
Communication Equipment	21,853	23
Misc. Electrical Products	2,447	5
TRANSPORTATION EQUIPMENT	36,991	36
Motor Vehicles & Equipment for	9,596	20
Aircraft & Parts	2,492	7
Ship & Boat Building	17,170	7
Railroad Equipment	7,733	2
Motorcycles, Bicycles & Parts		
Misc. Transportation Equipment		
INSTRUMENTS & PHOTOGRAPHIC EQUIPMENT	7,977	44
Lab. Scientific & Engineering Instruments	499	7
Mechanical Measuring & Control Instruments	6,064	22
Optical Instruments		
Surgical & Dental Instruments	1,063	14
Ophthalmic Goods		
Photographic Equipment	31	1
Watches, Clocks, & Clock-operated Devices	323	1
MISC. MFG. INDUSTRIES (METAL)	4,773	45
Jewelry, Silverware & Plated Ware		8
Musical Instruments & Parts		11
Toys & Sporting Goods (Metal)		8
Pens, Pencils, Stamps, etc. (Metal)		4
Costume Jewelry & Novelties		7
Misc. Mfg. Industries (Metal)		1
Misc. Mfg. Industries (Metal)		16

*Includes 9 Pennsylvania and N. J. counties. Source: Iron Age Research Dept.



MORE POWER to Delaware Valley comes from Philadelphia Electric Company's new Cromby station, near Phoenixville, Pa. Since 1945, PE has spent more than $1 million a week on new and better facilities.



SPINNING STEEL circuit breaker component from flat piece at Lukens Steel, Coatesville, Pa.

WELDING STEEL for 83-ton oil circuit breaker at General Electric's switchgear plant in Philadelphia.

How a Boom Builds Up

INDUSTRIAL EXPANSION → increased Valley power needs 2.199 billion kwh in 10 years and

CAUSED PHILADELPHIA ELECTRIC CO. → to expand facilities at rate of $1 million a week. Program called for company

TO BUY ELECTRICAL EQUIPMENT → from manufacturers like General Electric. GE built $13 million lab to check equipment,

WHICH TOOK STEEL → assemblies from Lukens Steel. Supplying these and other needs led to $32 million postwar expansion at Lukens. Others benefit from this.

♦ INTERPLAY of companies shows up in illustrations. Pennsylvania Railroad has a postwar expansion program that figures to run to $59 million by 1960. The Pennsylvania has built a big new ore pier, opened yards, added trains. Nearby, The Budd Co., which builds trains for the Pennsylvania and other roads, has found need for a $65 million expansion program.

Same process operates at Piasecki Helicopter Corp., where postwar expansion will run to $15 million by 1960. Among the 400 suppliers benefiting from this growth is the Vantool company, which makes parts for helicopter rotors.

These are just two examples of the Delaware Valley's integrated industry. Its deep water frontage, easy access to materials and markets, place it in the industrial forefront.

***Consumer market**

POPULATION: 22 million—14 pct of nation

BUYING POWER: $38 million—16 pct of nation

RETAIL SALES: $24 million—15 pct of nation

Industrial market

NUMBER OF COMPANIES: 8600 (approx)

CAPITAL INVESTED**: $1.892 billion

VALUE OF PRODUCTS**: $7.556 billion

VALUE ADDED: $3.163 billion

Labor***

TOTAL FORCE: 1.712 million

EMPLOYED: 1.6 million

METAL*: 190,000

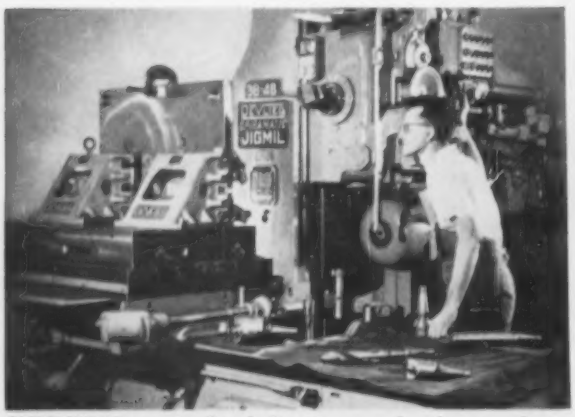
Transportation

WATER: 115 miles of deep draft channel; 18 million sq ft of deck space. Largest import tonnage in U. S. last year.

RAIL: Three trunk line roads serve area. Main lines run north, south, west.

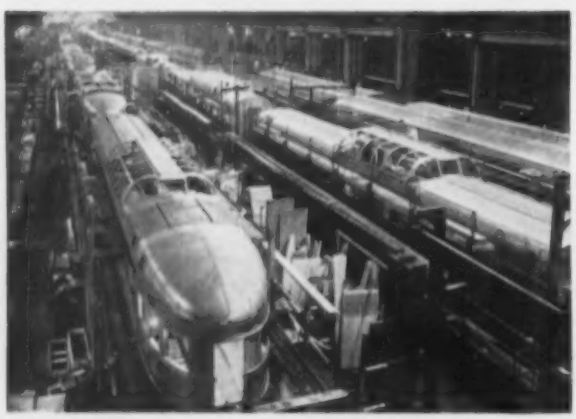
ROAD: 1000 truckers haul through area. Highway system is good, will get better.

*Within 100 miles of Philadelphia. **Pennsylvania counties only, 1951. ***8 Pennsylvania and N. J. counties, July 1953.



SUPPLYING parts for helicopters and other products, Vantool used this special jig borer.

BUYING parts from 400 suppliers, Piasecki Helicopter Corp. builds these wingless giants.



BUILDER: These cars are among wide range of rail products of the Budd Co., Philadelphia.

OPERATOR: Electric locomotive of Pennsylvania Railroad is part of big postwar expansion.

Atoms: They're Going Commercial

Industry built on atomic energy makes debut in nation's capital . . . Exhibits give indication of atomic uses in numerous fields . . . Model power plants shown . . . Portable inspection units—By G. F. Sullivan.

◆ AMERICA'S commercial atomic energy industry had its coming out party in Washington last week. Some 75 exhibitors—manufacturers of reactors, instruments, and controls—showed their wares at the first U. S. Trade Fair of the Atomic Industry.

For the first time, companies in this fledgling industry were able to show a merchandising approach to atomics. Not that there was any shortage of nuclear brains—leading off with AEC Chairman Strauss—but the assembled physicists and engineers seemed unusually aware of the job of selling management on their revolutionary ideas.

Some 13 companies who have either built, designed or are building reactors were on hand to stimulate interest in reactor sales for power or testing purposes. Many of the exhibits were brought directly from the "Atoms for Peace" conference held at Geneva in August.

At the Forum sessions, 60-odd papers brought members up to date on almost every aspect of the industry from latest reactor design and technology through the problems of fabricating nuclear fuel elements.

Portable Radiograph Projectors

Show exhibits included scale models of the power plant now being erected in Britain; the Babcock & Wilcox proposal for a 236,000-kw plant for Con Edison near New York; the package power reactor which Alco Products is building for the Army; and the General Electric 180,000-kw unit which will be built for Commonwealth Edison near Chicago. Combustion Engineering featured the 230-ton reactor vessel it is supplying Westinghouse for the Shippingsport, Pa., commercial power plant. Significance here was the graphic proof of the progress toward low cost commercial nuclear power.

Outside the power field, M. W. Kellogg Co. showed three sizes of portable self-contained radiographic projectors which are being marketed by Metal & Thermit Corp. Developed by Kellogg for gamma ray inspection of its fabricated products, the new unit is simple, safe and versatile.

The company sees a wide market for these "Kel-Ray" projectors. It now uses them to inspect large welded vessels — "shoots" 200 to 300 feet of welds at one time with one man. The job formerly required 5 to 6 men to get a picture of one foot of weld per exposure. The largest of the three units will handle up to 5 inches of steel; the smallest (costing about $1500) weighs 75 lb. It takes pictures through an inch of steel.

Training Units

These units are supplied with either cobalt-60, cesium-137 or iridium-192 sources, are insurance company-approved and shipped by Railway Express ready to go to work on arrival. The radiograph on this page (of the writer's watch) was made with a 40-sec. exposure to an iridium-192 source. The operator stood only a foot from the Kel-Ray projector because backscatter was well within allowable tolerances.

For the company or the college that wants to train reactor technicians, Leeds & Northrup showed a reactor simulator with a scale model reactor core and full scale instrumentation. Costing from $11,000 to $17,000, the unit resembles those already furnished to or on order from several U. S. universities.

Engineers from both Sylvania and Westinghouse told how the tricky business of fabricating fuel elements was generally unappreciated. There is a tremendous amount of accounting for every speck of uranium shipped to the fabricator, dozens of other problems in safeguards, handling, protection, scrap processing, etc. All of these add significantly to the cost of nuclear power. Higher put-through per facility may reduce these inevitable costs. Meanwhile it appears that no one is making any money to speak of in these fields, yet feel they must continue to expand and study ways of reprocessing spent fuel and refabricating it. Otherwise, nuclear power may never become economical.

RADIOGRAPHIC photo of author's watch indicates one of commercial uses of atomic energy. The field is growing into full-fledged industry.

INTERNATIONAL

REDS: Engineers Unravel Troubles

Technicians replace bureaucrats in attempt to raise economic standards . . . Hunt West technical skills as well as expanded trade to lift sagging economy . . . Hit inefficiency—By *David Scott*.

◆ WHILE the "Spirit of Geneva" is moving the Russians to let westerners have a closer look at their mills and factories, and even at an atomic power station, it is also lifting the curtain on their industrial troubles. They now freely admit that all is not well in Soviet engineering, and that much can be learned from the West.

Recently Premier Bulganin complained that Russian trucks and tractors weighed 50 pct more than American and British ones of equal rating. Most machines, in fact, were too heavy. Steel was squandered.

Blunt criticism came in from many quarters. Machine tool plants are not lowering production costs fast enough. At many factories equipment stands idle for long periods.

Inefficiency Hit

Metallurgy is also scolded. Output of profiles and particularly of flat-rolled products is less than planned. Quality of some grades is below standard. Production of certain non-ferrous metals is inadequate. Wastage of materials is widespread.

Now the Russians intend to strike out against inefficiency. This burst of energy is sparked by Bulganin, whose past career has been in industry, not politics.

Bulganin started by splitting up the top-heavy State apparatus which rules the national economy.

At the same time, factory managers are getting wider powers. They are free to make decisions formerly made by Communist Party officials.

By decentralization the Soviets hope to lift the crushing burden of bureaucracy. *Pravda* recently told of an electrical machinery plant where 78 signatures were needed to approve a design modification. A cement factory, it was reported, had one statistician for every 15 workers.

The Russians say that excessive paperwork and gross waste of manpower must be drastically cut. There is an acute shortage of labor, and one consequence of the reduction of armed forces in August will be the availability of 640,000 more men for productive work.

Expanded trade with the West will also help, for imported machines can make up for deficiencies in a country where demand continually outruns supply. Hence the Russians' interest in U. S. tractors and farm equipment. They are also keen on British machine tools, German ships and Swiss instruments.

More western trade with the Communist bloc will benefit the USSR in another way. Until now, it has drained its own resources to build up new industries for its allies. Soviet machinery has equipped steel mills in Poland, oilfields in Rumania and cement factories in Bulgaria. Thousands of machines are now earmarked for China's first motor vehicle plant.

For the Russians, such trade is a cold war expedient with little economic justification.

Investment:

Thinking about investing overseas? A new global organization geared to help you is taking shape in Washington. It's the "International Finance Corporation" (IFC), and the U. S. will act as the number one "angel" in financing purchase of capital goods and improvements for the world's "backward areas."

IFC will be located in Washington, and will be affiliated with the International Bank. It will focus special attention on countries which so far have made relatively poor technological progress.

A newly-enacted law permits the U. S. to join the IFC and to contribute $35.1 million toward its planned capitalization of $100 million. Similar legislative action has been taken by Britain and Canada. All told, 48 of the 57 member nations in the International Bank have given some indication they will participate in IFC.

When 30 of these countries, subscribing a total of at least $75 million in dollars or gold, have signed up with IFC, the agency will come to life. As now indicated, the time when this will take place may be late next spring.

Once in action, IFC is to provide venture capital that will assist private investors in more advanced countries to get into gainful activities in distant locations. Firms of small and medium size, possibly reluctant to place their funds far from home now, may do so with IFC encouragement.

One result, so far as American investors are concerned, probably will be greater diversification in the placement of capital.

CONTAINERS: Bug Bombs Are Booming

World War II's "bug bomb" is a multi-million-dollar business . . . Pressure can makers predict 1955 sales will set new record . . . Applications range from paint to whipped cream—By D. G. *Picinich.*

◆ AMERICA'S LOVE for finger tip controls is putting an unlimited ceiling on today's market for pressure packaging.

Aerosol can manufacturers, themselves a burgeoning consumer market for blackplate, tinplate, and aluminum, are rolling World War II's famed "bug bomb" into a multi-million dollar consumer industry.

This year, it's estimated pressure package makers will turn out close to 300 million aerosol units as against slightly over 200 million units produced in 1954. Retail sales of products packaged in pressure containers are expected to climb well over $200 million to set a new industry record this year.

Last year, Chemical Specialties Manufacturers Assn. estimates sales of products in 12 oz or smaller aerosols at $190 million—a 33 pct jump over 1953's $150 million. Since launching its industry surveys four years ago, CSMA reports a steady climb in container output.

Bright Future Ahead

In 1952, for example, output of pressure packages containing such items as pigmented and metallic paints, clear plastics sprays, shaving lather, hair lacquer, sun tan lotion, shampoos, deodorants, repellents, and Christmas "snow," came to over 96 million units. This was upped a year later to over 130 million containers, with last year setting an all-time high of over 216 million units.

Today's brightly lithographed, lightweight blackplate, tinplate and aluminum containers, in the opinion of industry spokesmen, have an almost unlimited packaging and consumer market ahead. Big container fabricators such as Crown Cork & Seal Co., American, and Continental Can companies are constantly alert to ideas for new product packaging in aerosol containers. They're experimenting to find wider range applications for use of aluminum—which has already found favor with the cosmetic industry. Use of plastics is another project under investigation.

Pressure Can Output

	(millions)
1951	34
1952	96
1953	131
1954	216
1955	300*

*Estimated

Source: Chemical Specialties Mfg. Assn.

It's estimated that the industry's current consumption of tinplate runs around 4.4 million base boxes annually. This averages out to approximately 2.2 base boxes consumed for every 1000 12 oz cans produced.

While both American and Continental have thus far held to production of seamed containers formed from flat sheet stock, Crown's "Spra-Tainer" is a seamless can formed from coil stock which is "drawn" into one-piece cylinders through a series of sequence stamping runs. The container's concave, double-seam bottom and conical-shape top are formed in the same stamping operation.

ENGINEER sprays acrylic plastic material from an aerosol container to protect drawing against smudging and moisture. Coating is transparent.

PRODUCTION

SHORTAGES: How Detroit Solves Them

Steel, copper, nickel head tight list . . . Trading among divisions a big factor . . . Substitutions mount in nonferrous metals use . . . Production slowdowns are avoided—*By T. L. Carry.*

• CHANGEOVER from 1955 to 1956 models has been accomplished with Detroit automakers scarcely skipping a production beat. And all indications point to a continued record breaking rate well into 1956.

But in today's tight metal market, search for scarce materials has become a problem on a par with the search for customers for the finished product.

In shortest supply are steel, copper and nickel. Purchasing agents are harassed to find sources of supply to keep production lines rolling. Production men are working overtime to improvise, substitute or scramble to make available materials stretch without hurting quality.

In steel, the situation has reached the point where automakers' inventories are cut in half and they are existing on a hand-to-mouth basis. The situation for copper and nickel is worse than steel.

Consumers have seen the price of copper jump from 30¢ to 43¢ since the first of the year.

Gray Market

Since the government dropped its allocation program for nickel two years ago, the supply has become progressively tighter. Although the metal is no longer under allocation, the government still gets first crack at what is available and has taken big chunks of it for the jet engine and other defense programs.

What's left is quickly gobbled up and good size tonnages find their way into the gray market. By the time big users get their share, small platers for the auto industry are sometimes forced to pay as much as $3 per lb.

KEEPING production lines going in Detroit requires know-how and ingenuity in times of tight material supply. But automakers know the secret.

What's being done about it?

Steel buyers are going to extreme lengths to build inventories as well as they can. They shop at warehouses to fill in the gaps and keep up a steady stream of pressure at the mill level for more steel at a faster rate. Some with financial interests in steel mills use them to apply pressure for delivery. However, these companies are just too big to get all their steel from one source and in many cases are forced to scrounge for steel the same as anyone else.

Trading Helps

The situation has not reached the point where producers have been forced to substitute gages or change specifications. One of the smaller firms here recently did shear a good quantity of sheet in order to obtain the proper narrow sizes needed for its production. Perhaps the best way of getting around shortages is trading steel within divisions of one company. Helping each other obtain critical sizes has paid off handsomely for more than one automaker.

Substitution is the long-range answer to the critical procurement problem for copper and nickel. This is also true to some extent for steel.

More Aluminum

Every year, the amount of aluminum being used in new automobiles increases. In 1956, for example, Packard has decreased the weight of its cars by another 60 lb through more extensive use of aluminum.

Two of the 1956 cars are coming out with aluminum grilles. Some autos use aluminum instead of copper for battery cables. The industry has been experimenting with aluminum radiators and some producers have been toying with the idea of substituting aluminum for copper wiring.

Besides a more extensive use of aluminum there are two other possible answers to the nickel shortage. Automakers could use less nickel for plating or substitute white brass, a combination of copper and zinc.

White brass is not a satisfactory substitute. First because copper is too scarce and too expensive. Secondly, the results are not as good. The plating holds up well for about 1 year and then turns a dirty gray color.

Hold Specs

The industry is definitely against lowering present specifications for plating. Producers had to cut down on plating standards during the Korean War but they have increased their specifications since it ended.

Present specifications at one company call for plating not less than 1.5 thousandths in. The plating material can be either nickel or a combination of nickel and copper. If the two metals are combined, the amount of nickel used cannot be less than six ten-thousandths in.

So far the industry has been able to meet the standards and they have no intention of lowering them.

There is a possibility that stainless steel could be used for trim on cars. Even with the present shortage of nickel, stainless would be too expensive to use and it is also hard to get.

Aluminum looms as a large item as a substitute for scarce metals in the auto industry, but few substitutions can be accomplished over night. In the meantime, the industry is still faced with critical shortages.

Look to Stockpile

With this in mind, several organizations have sought support for a plea to Washington to release some of the copper and nickel from the strategic stockpile.

The Copper and Brass Warehouse Assn. and the National Assn. of Metal Finishers were two of the groups actively participating in the program. Nobody knows how big the stockpile is.

Contracts:

Military tightens overpayment policy on defense contracts.

Military suppliers, particularly aircraft builders, are to find the armed forces clamping a tighter control over payments made prior to completion of an order.

All the services are falling in line with a new Defense Dept. directive calling for a change in administering contracts of the incentive and price-revision type. Its purpose: to cut down the amount of government money owed by firms overpaid for performance of contracts.

Sums which suppliers owe the services are mounting, says one Defense Dept. official, because the original estimates and provisional pricing decided on were too high. The amounts that may have to be returned to the government by aircraft firms reportedly total $200 million.

Rifle Decision Soon

Top Army officials will decide soon to adopt a new rifle which will subsequently become the standard shoulder-fired weapon of the North Atlantic Treaty Organization (NATO) nations.

Delay in making the decision is caused, in part, by the existence of two new weapons, one Belgian and one American, either of which may meet combat needs.

Each of the new weapons, firing .30-caliber ammunition, is seen as a replacement for the M-1 rifle, the Browning automatic rifle (BAR), the carbine, and the submachine gun. Each can be fired at semi-automatic and fully automatic rates. A switch to either is expected to reduce troop-training costs and weapons production expenses.

Tests of the Belgian and U. S. products have been going on for some three years.

Study Synthetic Mica

General Services Administration will enter into research and development contracts with industry to attempt to find materials and processes to replace natural mica in defense uses.

Office of Defense Mobilization asked GSA to seek the substitutes because of a short supply of natural mica would be inadequate to meet wartime requirements.

The five-year research program will be undertaken in part by the government and in part by industry with government financial aid. It will include an expansion of basic research on synthetic mica; applied research by industry on improving synthetic mica products, developing substitutes.

NAVY DEMON, new fighter produced by McDonnell Aircraft Corp., aboard the U. S. S. Ticonderoga where it recently underwent qualification tests.

A LETTER FROM THE PUBLISHER

Dear Reader,

On the opposite page is a preview of the type of front cover you'll soon be seeing on The Iron Age each week. To give you an idea of what our new front cover will be like, we've prepared it just as though it were the cover of the issue you are now reading.

From a reader's viewpoint there are several things we think you'll like about it. First, the cover's distinctive appearance will enable you to identify your Iron Age immediately when you want it. Secondly, it is a news cover designed to serve you better. By highlighting important articles right on the front cover there will be less chance of your missing major market and technical developments in your field. We also feel it will point up the wide range of editorial material offered each week.

But most of all--by making a sort of show window of our front cover we hope you'll become even better acquainted with us.

And so, starting with the first issue of '56, you'll see your Iron Age in a new format--one which we believe will be more attractive and useful to you.

George T. Hook

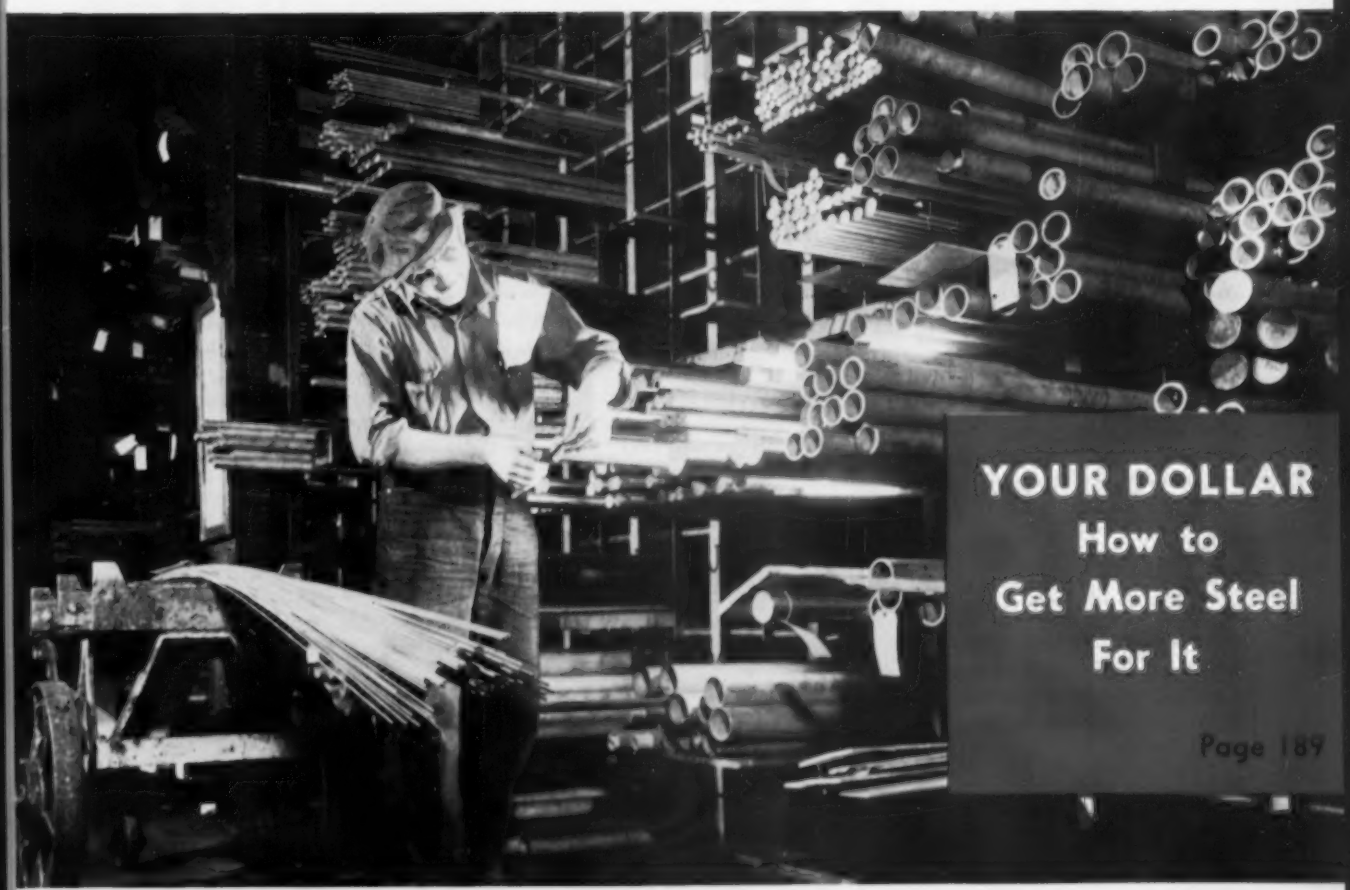
Publisher

Cover photo courtesy Joseph T. Ryerson & Son, Inc.

October 6, 1955

The IRON AGE

The National Metalworking Weekly



YOUR DOLLAR
How to Get More Steel For It

Page 189

Metalworking Drama On the Delaware 147

Atomic energy goes commercial 151
What Reds need most: Know-how 152
How Detroit licks material shortages 154
What GOP is cooking up for '56 169

Digest of the Week—Page 2

EXPANSION IN INDUSTRY

Fast Tax:

End of tax-am in sight as ODM kills all but 32 goals.

Industry use of fast tax amortization as an aid to expanding production will be virtually a thing of the past by the end of this year. Of the 226 goals originally set, only 32 still remain open. A score of these will die at the end of this calendar year.

In its latest move, the government closed the door on further fast tax certificates for 26 goals, bringing to 35 the number of goals closed in the last two months.

Eleven other goals, which had been among 38 suspended August 11, were reopened. One goal, taconite ore, was kept in the suspended category for further study.

Ten of the 11 reopened goals were revised, several to increase desired capacity and several to limit the time in which they will remain open.

Among those reopened were freight cars, covering those for which construction is authorized or firm orders placed by Dec. 31, 1955, and rutile, for which the goal was raised 10,000 tons to 35,000 tons to be filled by the end of 1955.

Other reopened goals include commercial aircraft, domestic petroleum, electric power, high voltage switchgear, and power and distribution transformers, aluminum forging facilities, and ocean-going tankers.

Industries Do Well

High pressure demand is pushing the rubber and chemical industries to all-time high production and sales records.

In the rubber industry, factory output, consumption, and sales all are humming along at peak levels —despite the seasonal decline in automobile output. Tire production for passenger cars, trucks, and buses is expected to pass the 100,000,000 mark for the first time.

Chemical industry sales for the year are going to wind up about 30 pct ahead of 1954 sales. Production this year is about 13 pct ahead of 1954—the previous peak year.

Competition for chemical markets is going to become progressively keener as a result of increased domestic costs, additional capacity from newly-built plants, and mounting expansion abroad.

Break For Small Firms

Small firms are going to get a bigger share of the government's civilian orders, the General Services Administration promises.

First step in a new drive to channel all possible business to small companies is a set-aside of three orders for stationery worth about $400,000. GSA defines small business as firms with less than 500 employes.

Small Business Administration and GSA are working together to step up government procurement from small companies.

Convert to Pipe Coating

Armco Steel Corp. will spend about $360,000 to convert the recently acquired Middletown, Ohio facilities of Warren Steel Corp. into a pipe coating plant.

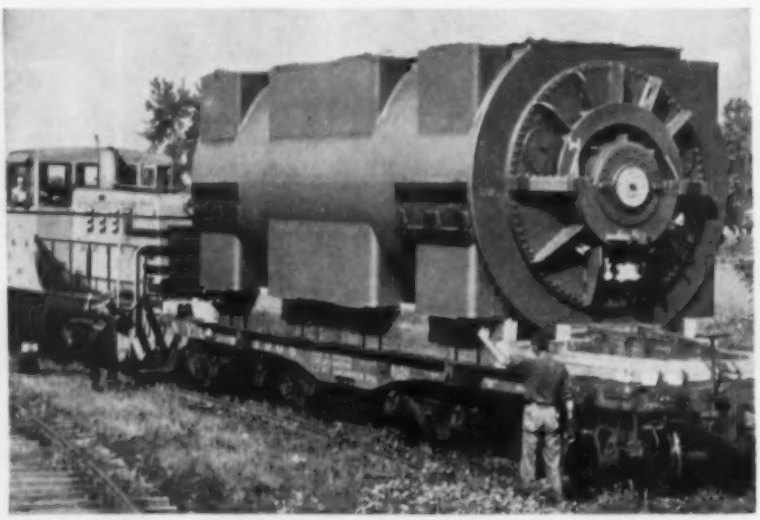
The major part of the conversion will be accomplished by moving the company's present pipe coating facilities to the new plant. New machinery will include abrasive cleaning equipment, a unit to line the pipe and a wrapping machine.

Foundry Completed

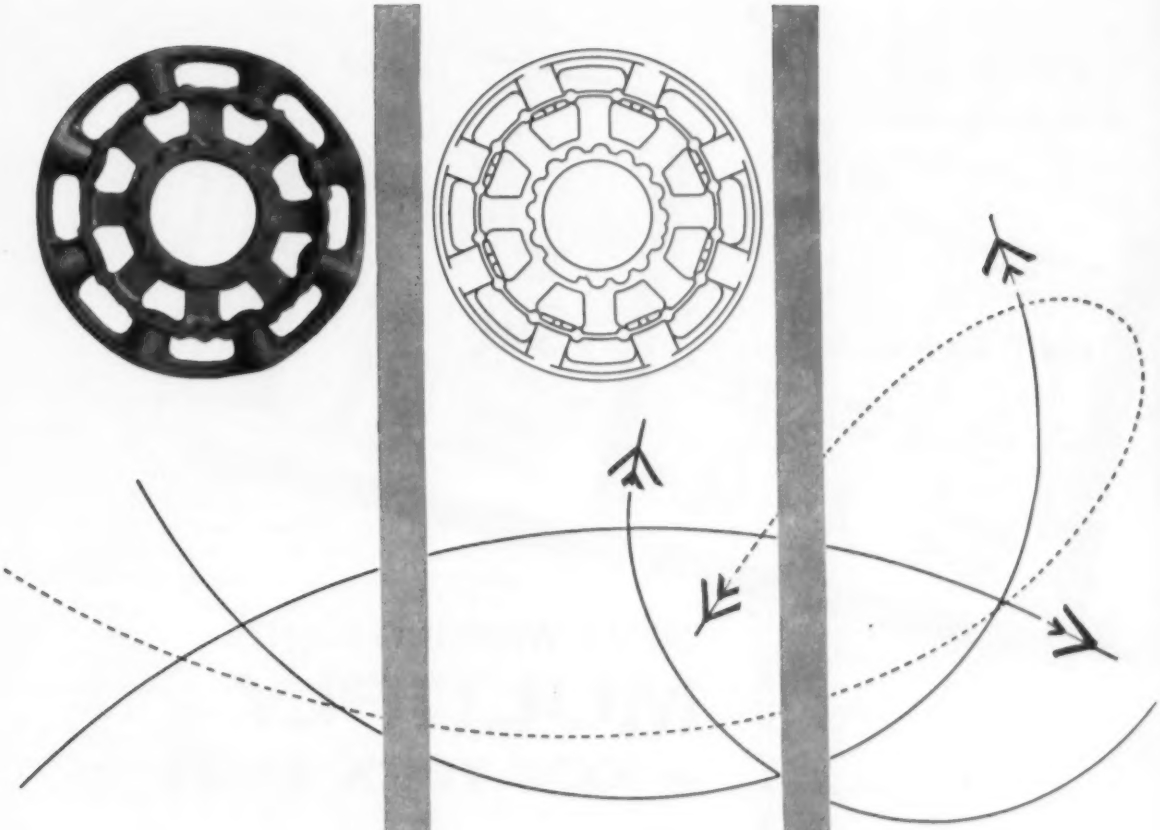
Union Malleable Manufacturing Co. has completed a new foundry in Ashland, Ohio, as the first phase of the company's $8 million expansion program.

Preliminary test runs have been completed and the section is now in full operation.

Plans are now being drawn for the second part of the expansion program. It will house the electric annealing and automatic galvanizing operation and machine shop facilities. It will be started in 1956.



BIGGEST load ever shipped from General Electric's Schenectady plant is this 485,000 lb generator stator destined for Detroit Edison, River Rouge.

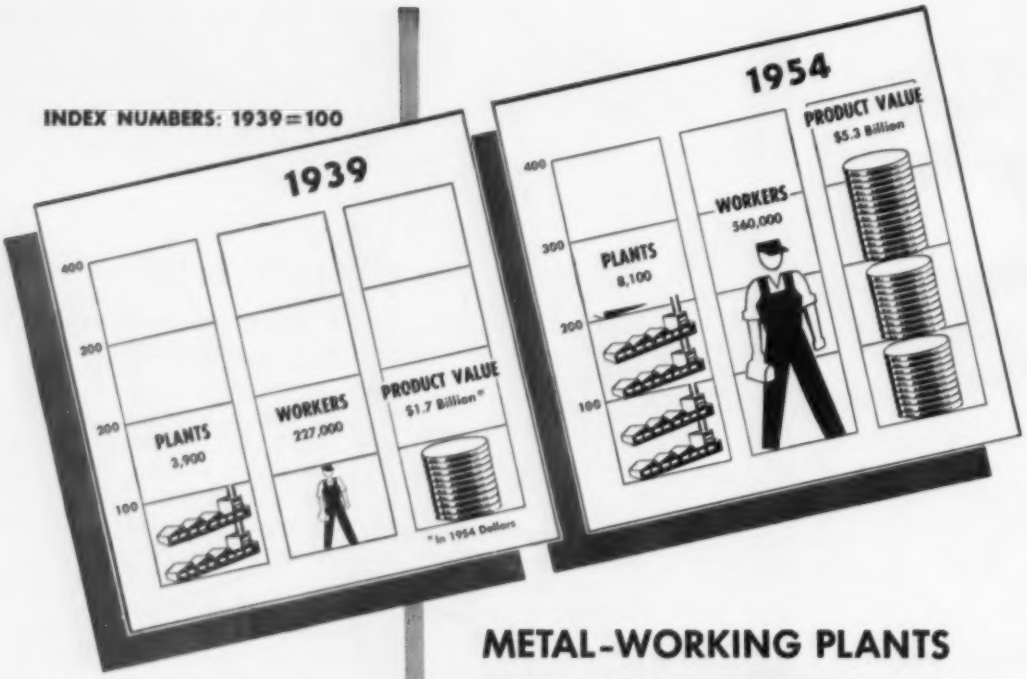


When casting jet supports *Advanced Know-How* *makes the difference!*

To meet the unusual standards for soundness and dimensional accuracy required for this 35 pound stainless steel jet support ring, Cooper Alloy foundry engineers recommended the Shellcast® method with a long list of special controls and precautions. To maintain close tolerances across the 11″ bolt circle; surface finish approximately 125 RMS; 100% x-ray examination; 100% zyglo check; and other equally rigid standards means imagination, initiative, and skill to the 'nth degree. As with so many other "impossible" castings now being produced regularly at Cooper Alloy—*Advanced* Know-How makes the difference. For the full story on these jet supports, write for case study #1.

COOPER ALLOY
CORPORATION · HILLSIDE, N.J.

Foundry Products Division



METAL-WORKING PLANTS

MULTIPLY

IN NEW YORK STATE

New York State has more metal-working plants than any other state, and over the years they keep multiplying. In the past fifteen years, the State's metal-working establishments have more than doubled in number, while the value of their products (in constant dollars) *has more than tripled!* At the same time, workers in these industries have increased 140 per cent.

More industries . . . and a greater variety of industries . . . operate at a profit in New York State than in any other. This is true of thousands of metal-working plants. It can be true of yours.

Our Industrial Location Service is prepared to give you facts — professionally analyzed for your particular benefit—covering sites, raw materials, transportation, labor and power. Our booklet—"Industrial Location Services"—explains what we do and how you can use our knowledge. For your free copy write New York State Department of Commerce, Albany 7, New York.

SUCCESS BEGETS SUCCESS

NEW YORK STATE

Averell Harriman
Governor

Edward T. Dickinson
Commissioner of Commerce

Report to Management

Ability to Rebound

Vigor with which the stock market bounced back from its sharp slump is a tribute to the firmness of the economy. If you had feelings of economic panic in the period following President Eisenhower's heart attack, the comeback should have eased them.

A full scale panic could have developed if the present high level of business was not based on a firm foundation. It's true that a few lost their heads, but most of the panic selling came from speculators and market players, not investors.

Even while the market appeared to be in full flight, it is known that the big foundations and major corporate investors not only stood their ground, but were eager to buy the day following the $14 billion drop in the market. The market immediately jumped back, some stocks going even higher.

That means that the investors who control or influence corporate decisions did not hesitate to back their confidence. In fact, they were happy to expand their investments and looked on the drop only as an opportunity to buy stocks at a price they believed below the real market level.

Your Stake in the Market

Unless you are in the market more than most, these gyrations shouldn't have hurt you or your business. The rebound factors are those that mean something to you.

You can be sure that industry will continue to expand, that plans in that direction are unchanged. It is not a one man boom, or even a one party boom. It is based on new products, new markets, an expanding population with its demand for a higher standard of living, not on the bulls and bears of the stock market.

Don't Say Inflation

There is a tendency among many economists and business experts to treat "inflation" as a naughty word. This attitude is prompted by the rising level of prices that is hitting you as a businessman and consumer alike.

You must have noticed the new record level of the Government's wholesale price index for non-farm products. It passed the old high point of 117.3 set in March of 1951 and now is almost at 118.

But there are few danger signals despite all this. Inflation as such occurs only when there is a large supply of money in circulation compared to a small amount of goods available for purchase.

This is not the case when you have your choice of all kinds of consumer products. Shortages do occur, but not at the retail level. Only a few products or raw materials such as copper might approach the inflationary point.

There is little chance of any runaway prices anywhere. You may have to adjust to a slowly rising price level, but competition and consumer pressure can keep things in hand. You also may have to face the fact that the steady price line that remained almost unchanged in the boom will now go up at a small angle.

A 5 pct increase in prices may occur in the next year, the pace probably established by the increase in automobile prices. There is also some hope of lower prices for some commodities when current periods of extreme shortage ease.

Copper is an example of a product that will ease in price when the market drops off. This is not likely under the conditions that exist today and increases may come before any decline in price.

INDUSTRIAL BRIEFS

Motion Picture . . . The properties and applications of ductile cast iron are described in a 15-minute, sound color film of the same name. Owned and released by International Nickel Co., New York City, it is available to industry, technical societies and educational institutions.

Company Acquired . . . The Norden-Ketay Corp. has acquired control of the Frohman Mfg. Co., by trading 50,000 shares of company stock for all of the outstanding Frohman issue. Frohman, makers of precision and high-speed shafts and gears, is expected to gross $1.5 million this year. No change in management is anticipated.

Oil Companies . . . F. E. Anderson Oil Co., E. F. Houghton & Co., Socony Mobil and Sun Oil Co. were commended for their service at the recent Machine Tool Show in Chicago. The oil companies rendered coolant and lubrication service to the exhibitors at the show and were on hand to apply rust preventatives for shipping the machinery after the show.

AEC Invitation . . . Leonard L. Strauss, chairman of the Atomic Energy Commission has invited proposals for the development, design, construction and operation of small-scale power reactors in a range of 5000 to 40,000 kw. Individual organizations, groups, utilities or equipment manufacturers must have their proposals submitted by Feb. 1, 1956.

Stock Warrants . . . Warrants of subscription rights to Detroit Steel's common stock have been sent to current stockholders of record in the ratio of one share for each five held. The price is $12 per share on 503,155 shares being offered.

New Alloy . . . A new zirconium alloy, called Zircaloy 2, declared to be extremely resistant to corrosion, temperature and high pressure water, has been developed by Westinghouse.

Kennecott . . . The Kennecott Copper Corp. has purchased 52 pct of Tin and Associated Minerals Ltd., a columbium mine and concentrating plant in Nigeria, W. Africa. Columbium is used extensively in aircraft because of its resistance to high temperatures and corrosion.

Auto Outlets . . . The total number of retail automotive outlets in the U. S. has increased by 1000 in the last year, according to the Automotive Direct Mail Div., of Chilton Publishing Co. This figure was arrived at by calculations that 16,360 new establishments were opened while 15,366 closed their doors.

Gyro Compass . . . Although it is less than 2 pct the size of its predecessor, the new gyro compass developed by Arma is considerably more rugged and at least as accurate. Tests by the Army Corps of Engineers at Fort Belvoir, Va., including airborne, land and water vehicles, indicated that it was not susceptible to magnetic structures, including radar operations.

New Office . . . The Kansas City branch of Inland Steel Products Co., Milwaukee, has opened a new district sales office in Dalias to cover the entire state of Texas with the exception of El Paso.

Order Index Up . . . A gain of 11 pct in distributors' orders for industrial supplies and machinery was indicated by the American Supply & Machinery Mfg. Assn.'s new order index.

Nialite Prop . . . The Texas Co., N. Y., has placed an order with Baldwin - Lima - Hamilton for a four-blade nialite propeller for an oil tanker. Nialite, a copper, nickel, aluminum alloy, was chosen for its reputed light weight and corrosion resistance.

Jet Power Pack . . . An emergency power unit to supply both electrical and hydraulic power in the event of normal power failure has been designed and built by Marquardt Aircraft Co. for the new Navy jet fighter, the Chance Vought XF8U-1. The unit carries a rating of 25 hp, permits aerial restarts and operates a radio, instruments and flight surface controls.

Atomic Coal Committee . . . The bituminous coal industry has established a special committee to study the influence of atomic energy on industry operations. The coal industry is concerned because the generation of electric power now using fuels such as coal seems likely to be accomplished by generation of electric power atomic energy in the future.

New Company . . . Frank R. Cook Co., Inc., has been formed by a group of New York and Denver industrialists with Mr. Cook at the helm, to engage in the development of aeronautical and electronic equipment. Laboratory and manufacturing facilities will be in Denver and Colorado Springs.

Auto to Boats . . . Kehrig Mfg. Co., an automotive supplier formerly limited to molded prototype auto bodies and aircraft fixtures, intends to enter the pleasure boat field with a 30-ft steel cabin cruiser. An assembly line to produce 200 of the craft has been set up.

"Samples from the Furnaces." Agnes Potter Lowrie, famed artist daughter of a noted steelmaker, portrays a closeup of familiar objects at testing time: the protective blue glasses through which old-timers visually estimated temperatures; the slag spoon and mold for physical and chemical control of steel quality.

The Fine Art of Steel Making

Why, during World War II, were American steel makers with the greatest production capacity in the world fearful of shutdowns?

The Achilles Heel of the industry was palm oil. Then considered the essential lubricant for cold rolling tin plate, palm oil was obtainable only from foreign sources and had to be shipped halfway around the world.

That this danger has now been eliminated is due to the ingenuity of American research coupled with the readiness of steelmen to adopt new and better products and processes.

Almost 3 years ago Ironsides announced Palmoshield as the first domestic replacement for imported palm oil. Within six months two-thirds of our major tin plate mills were using or testing it, often with remarkable results. For example, one company stepped up production 15% with no additional investment, no increase in labor, and no change in mill operation.

Recognized as today's most significant advance in lubrication, Palmoshield offers five distinct advantages:

1. Produced in the heart of the steel industry. Users need not stockpile.
2. Made from freely available domestic materials.
3. Subject to exact chemical control—free fatty acid content to within ½%.
4. Price is not artificial, but fluctuates freely with the domestic fat market.
5. Proved in production to deliver increased tonnage at less cost.

Ironsides research, which developed Palmoshield, is now geared to the future. A flexible team—the "custom tailors" of lubrication—Ironsides engineers are available for technical assistance on special problems of any nature or size. A letter will summon them without obligation. Address The Ironsides Company, Columbus 16, Ohio.

SHIELD PRODUCTS

Ironsides

By the makers of Palmoshield • "the palm tree that grows in Ohio"

AUTOMOTIVE ASSEMBLY LINE

Continental Prestige Comes High

Ford's super luxury car will approach $10,000 . . . Horsepower secret in prestige bid . . . Long, low, wide look has "formal" lines . . . New Studebaker loses foreign styling in comeback bid—By T. L. Carry.

◆ THE LONG-AWAITED Lincoln Continental made its public debut here this week amid 3 days of fanfare designed to give the new automobile the prestige which a car in the $10,000 class deserves.

The car is aimed specifically at the upper fringes of the luxury market and the Ford Motor Co. has gone to great lengths to make sure that the Continental reeks with prestige.

A new wrinkle in snob-appeal is the absence of horsepower announcement. The intended effect is that a Continental buyer should have confidence that a car in that limited range will have the power and performance to meet any challenge on the road. With this in mind, it is doubtful if the hp of its modified Lincoln engine ever will be revealed publicly.

Limited Number . . . The same thing holds true in regard to the number of Continentals which will be produced. Estimates run anywhere from 3000 to 6000 for the first year. Actual output, of course, depends on the number of cars dealers will sell.

It is felt that, despite the extremely high price of the car, no dealer is going to be under pressure to sell a lot of them and this will help keep production at a low level.

No car in the world probably will ever be worth $10,000, but the new Continental does give the impression that it is worth more than an ordinary automobile.

Styled in what the Continental Div. calls "Modern Formal" lines, the design is based on functional use of chrome, metal and glass to achieve an air of simplicity and elegance.

Few Options . . . The hood is almost one-third of the car's overall length of 18 ft. The new car is only 4 ft 8 in. high and is almost 6½ ft wide.

The only optional feature on the Continental is air conditioning. Among standard features are automatic transmission, power brakes, power steering, and power operated seats and windows.

The car is going to be well tested before a customer lays his money on the line to buy one. Each engine is run on a dynamometer twice—once by itself and then a second time with its torque converter transmission.

Mark II . . . The new Continental has been designated the Mark II. This is a departure from the practice of identifying cars by model year and is another gimmick for the car's buildup.

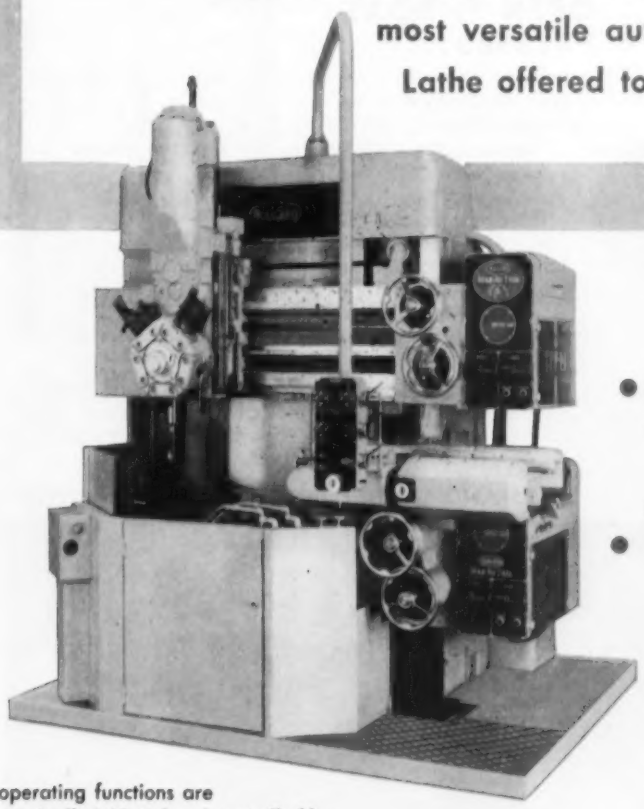
William C. Ford, general manager of the Continental Div., says the new designation is based on the theory that the Continental produced between 1940 and 1948 constituted the Mark I series. Such designations, according to Mr. Ford, emphasize the basic body design of the car rather than a model of any particular year.

Everything about the car has been designed with one thing in mind—prestige. Whether or not the Continental will be able to get a share of the luxury market is still a moot question but one thing is sure. Whenever anybody sees one on the road he is going to think of the Ford Motor Co.

ELEGANT: Ford Motor Company's new prestige model, Continental Mark II, retains traces of the old Continental, measures 18 ft long, 6½ ft wide.

don't BUY BULLARD *unless* YOU WANT THE BEST!

Yes, Bullard Cut Master, Model 75 with Man-Au-Trol Conversion Unit is the best . . . most versatile automatic Vertical Turret Lathe offered to industry today . . . . .



BULLARD

All operating functions are automatically initiated and controlled by one function control drum and two detector drums in Man-Au-Trol: Table Speeds (20 Available), Feeds (16 Available), Head Travel in feed or traverse, right or left, up or down or 45° in any quadrant and Turret Indexing.

Since the function control drum can be pre-set for a given job in advance, the machine down time for job change-over is reduced to a minimum.

The Man-Au-Trol Conversion Unit can be applied to any or all heads of Cut Master, Model 75 right in your plant.

Your Bullard Sales Engineer will be glad to explain the many other advantages offered by Man-Au-Trol — your best buy in an automatic vertical turret lathe — call him or write for our new catalog.

THE BULLARD COMPANY

286 Canfield Avenue • Bridgeport 2, Connecticut

Please send me a copy of the
NEW MAN-AU-TROL, MODEL 75 CATALOG

NAME.....

COMPANY..... POSITION.....

ADDRESS.....

CITY..... ZONE..... STATE.....

DIAMOND MACHINE TOOL COMPANY

PICO, CALIFORNIA

Send us your catalog, "Profit From Presses" at once.
No cost. No obligation.

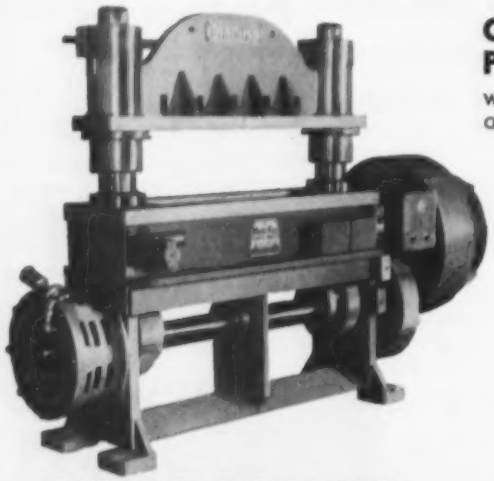
NAME.....

COMPANY.....

ADDRESS.....

CITY.....STATE.....

PROFITS from PRESSES



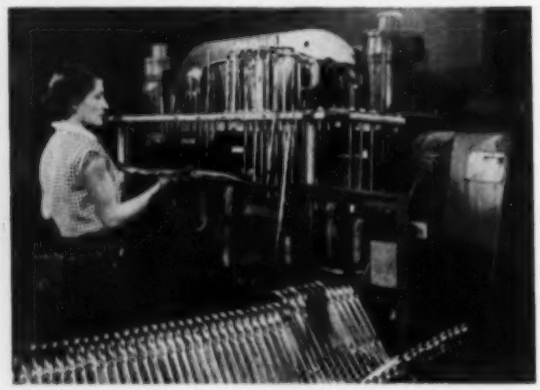
DIAMOND MULTI-MAX PUNCH PRESS
MODEL 5036 ILLUSTRATED

OPEN THROAT PRESSES...

with long bed and ram areas illustrated in a new catalog, "Profit From Presses". Twenty pages with case history photographs such as illustrated below. Diamond Multi-Max punch presses are available in 30 and 50 tons capacity, 100 tons on special order. Six models for your selection. 24", 36", 48", 60", 72" and 84" working surfaces of bed and ram lengths. Air clutch and air brake at no extra cost. Mail in above coupon for your copy of this catalog, or write on your letterhead.

SALES AND SERVICE IN ALL PRINCIPAL CITIES

KWIKSET LOCKS, INC., ANAHEIM, flash trimming "Zamac" zinc alloy casting in the manufacturing of trim hardware for automobiles. Multi-cavity dies are used for flash trimming multiple parts at each stroke. The press has a 5" stroke for working clearance to remove parts.



ELECTROWELD STEEL CORP., AZUSA, piercing, forming, and crimping 1⅜" 18 and 16 gauge tubing for dinette chrome furniture. The permanent setup of these three dies over the long bed area of the press eliminates down time in changing dies.

DIAMOND MACHINE TOOL CO.

PICO, CALIFORNIA

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
Oct. 1, 1955	118,406*	16,118*
Sept. 24, 1955	127,038	24,766
Oct. 1, 1954	66,244	17,866
Sept. 25, 1954	54,918	16,986

*Estimated Source: *Ward's Reports*

Studebaker:

1956 hopes rest on restyled line.

After a year of combined operations, Studebaker-Packard Corp. is looking forward to 1956 as the time when the new firm will begin to make its mark in the auto industry.

In the words of James J. Nance, president of the corporation, "This is the year we are going to move up."

Mr. Nance does not deny that 1955 has been a rough year for the new company. There were many problems which the company had to face. Biggest headache was one of elimination and consolidation and setting up a management team which could help restore both Studebaker and Packard in the automobile field.

Mr. Nance emphasizes that the main objective of the merger was to make room in the industry for another full-line company in both the car and truck field. The company has not deviated from its objective.

New Studebaker

Thus, the company has come up with a full line of products for 1956. Studebaker has been completely redesigned to cover the low price field, the Clipper and Packard have several new innovations for the medium and high price fields.

From a style standpoint, the 1956 Studebaker is all new. The foreign-type body style which previously marked Studebaker has been completely abandoned and the 1956 model has a boxy look which more closely resembles an American car.

The car features a safety-eye speedometer which enables the driver to watch his speed without taking his eyes off the road. Numbers which show the speed are a green color up to 40 mph and red beyond that point, a subtle reminder to drivers to take it easy.

Push Button Shift

Among the features of the new Packard are an electrically controlled push button drive for automatic transmissions and a non-slip differential. The latter innovation transmits tractive power from a wheel on a slippery surface to a wheel on a tractive surface. It enables a car to move forward freely over icy or slippery surfaces and will be a great aid to winter driving.

Level Production

Despite the gyrations of the stock market following President Eisenhower's heart attack, auto producers say that the country's economy is still basically sound. They cite the quick recovery of the stock market as one healthy indication.

In the meantime, the industry has not changed its plans or predictions for another record year of production.

Before 1955, auto companies sold 35 pct of their cars during a 3-month period. Today, the market is levelling off as far as sales are concerned. There is no longer any big spring buying rush from the public and chances are that there never will be one again.

Sales managers have assumed a new attitude toward merchandising cars and are keeping up a constant stream of pressure in order to sell more cars right through the year.

The new aggressiveness has forced the auto companies to abandon economic theories regarding production and they will never be content to return to the old system of selling most of their cars in a short time.

THE BULL OF THE WOODS — By J. R. Williams

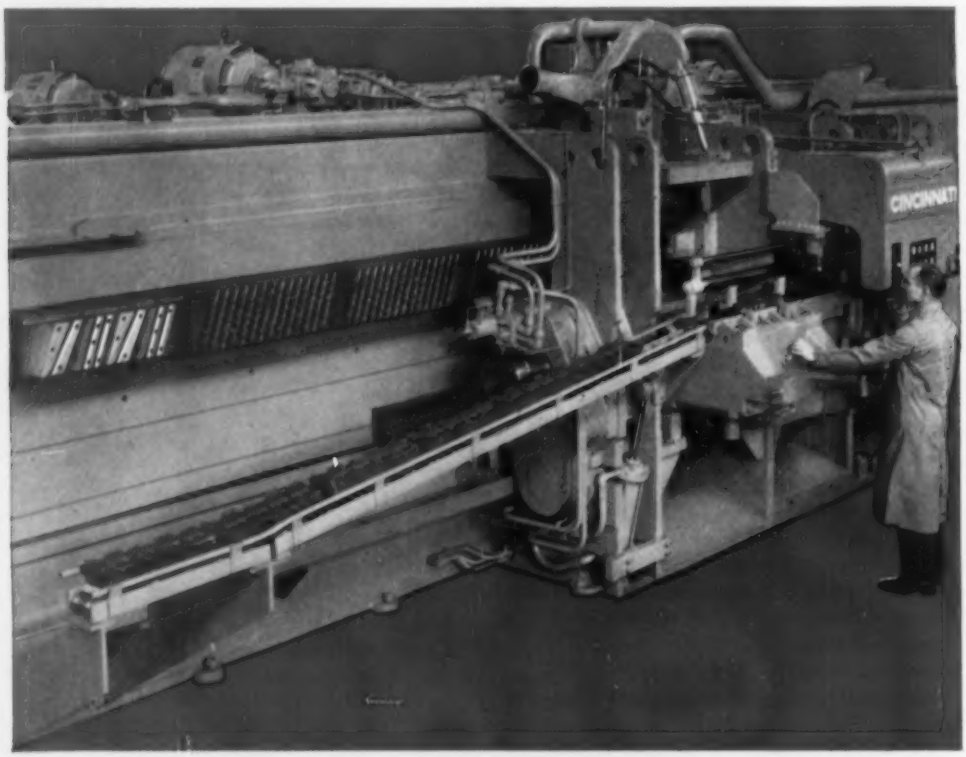
THESE GUYS IS SPECIALISTS! NOT ONE IN TEN KIN DO LIKE WE USED TO -- TURN OUT EVERY PART OF EVEN A BIG LOCOMOTIVE, THEN PUT IT ALL TOGETHER AN' RUN IT TOO!
YEH, BUT THESE GUYS WORK THREE TIMES CLOSER THAN WE DID! WE USED TO THINK THAT A THOUSANDTH OF A INCH WAS CLOSE -- BAH!
THAT'S A DELEGATION OF OLD RETIRED ALUMNI OF TH' MACHINIST'S TRADE -- AN' THEY THINK TH' GUY IS A JUDAS!
SO DO I -- NONE OF 'EM EVER WENT PAST TH' FIFTH GRADE AN' A MUZZLE LOADER HERO IS AS GOOD AS A MACHINE GUN HERO ANY TIME!
J.R.WILLIAMS 10-5
THE TRAITOR

BROACH

Double-Action Cincinnati

BROACH

Broaches 150 Cylinder Heads per Hour



Within the past few years spectacular progress has been made in the design and cost-reducing potential of machine tools. For example, consider the cost savings now possible in the machining of cylinder blocks and heads.

Today, CINCINNATI Horizontal High Speed Surface Broaching Machines are producing 2½ times faster than comparable equipment a few years old, and tool life per unit has increased 25 times!

While these cost savings are more spectacular than might be realized in the production of smaller parts, they are indicative of the big strides made by Cincinnati Milling in reducing costs through the application of modern broaching techniques. Remember this: Cincinnati's broaching experience dates back more than 20 years . . . Cincinnati was first in developing many present-day broaching concepts such as electro-mechanical drive . . . Cincinnati builds a complete line of horizontal and vertical broaching machines, including large special broaches built to your specifications. Would you like to have a picture-book review and brief specifications of CINCINNATI Horizontal Broaching Machines? Write for catalog No. M-1910.

THE CINCINNATI MILLING MACHINE CO., CINCINNATI 9, OHIO

PRODUCTION DATA

Surfaces broached	top, joint, intake and exhaust faces
Cutting speed	150 feet per minute
Stock removal	3/16" (½ ton per hour)
Production	150 heads per hour

CINCINNATI 22-foot stroke, Two-Way Horizontal Broaching Machine, tooled up and conveyorized to broach cylinder heads.

CINCINNATI

CINCINNATI

MILLING MACHINES • CUTTER SHARPENING MACHINES • BROACHING MACHINES • METAL FORMING MACHINES • FLAME HARDENING MACHINES OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

Will Peace and Boom Be Enough?

Republicans hope nation's healthy state will carry candidate to presidential victory . . . Any weakening of economy will bring bolstering action . . . But President's illness leaves gap—By G. H. Baker.

◆ TAX CUTS, stepped-up government spending, higher farm prices.

That's the Republican formula for winning the national elections next year—even though nobody knows now who the Republican candidate is to be.

Any sign of business slippage, no matter how remote, will draw prompt fixing from the Eisenhower Administration in the months ahead.

Republican leaders are privately worried about their chances for victory in the 1956 elections. True, they have a strong argument in the "Peace and Prosperity" slogan, but they fear the loss of Ike's personal charm and magic.

Push Prosperity . . . The Republican plan is to do everything possible to keep the country prosperous and at peace. Meanwhile, the search for presidential candidates is on. Most Republicans believe Ike is necessarily out of the running because of his health.

Sen. George Bender, R., O., says confidently, "We've got plenty of good men" to run for the presidency, but he doesn't say who.

Leading Democrats are falling all over themselves in the scramble for the presidential nomination. Sen. Kefauver, D., Tenn., has tremendous personal following, but is poison to the party bosses. Ex-Governor Stevenson has the backing of the bosses, but is viewed with distrust in the Deep South. Gov. Harriman wants to be President and is prepared to spend millions of his personal fortune to win the office.

Sales Tax Boils . . . Talk of a national sales tax is boiling again at the Capitol. Government tax experts are drawing up detailed studies of ways to squeeze a bit more revenue from consumers. And nearly all these studies are emphasizing the proposition that a uniform federal tax on sales will solve the government's nagging revenue problem.

Whether or not a national sales tax should be applied at the manufacturing level or at the retail level is a touchy point that won't be easily settled.

Nobody wants a sales tax, but manufacturers are telling Congress that if such a tax is inevitable it should be applied at the point of production, whereas retailers are equally insistent that it should be applied at the point of sale to the final consumer.

See Limit Reached . . . Tax lawyers, both at the Treasury and within the Congress, are privately convinced that incorporated business and individuals have been pushed to the taxable limit. Some will admit that the existing tax on corporation income (52 pct) is too high, that it is stifling plant expansion, research, and development of new products.

In the weeks ahead, two congressional groups will delve into the problem. Neither of them will come up with an answer, but both will stir the problem up.

Revenue experts are disturbed over the government's inability to make ends meet in times of prosperity. The nation is at peace, jobs are plentiful, sales are high, and the country is living well. (If you can't balance the budget in good times, when can you balance it?) A sales tax, it is argued, is the only big remaining untapped source of revenue—and 1956 may be the year to tap it.

You Can't Sue The Weather Man

◆ Property owners who suffered severe losses in floods and storms this year may be tempted to sue the U. S. Weather Bureau for lack of complete warning, but it won't do any good.

◆ Bureau officials contend that services provided by the agency constitute forecasts, rather than guarantees, of weather behavior. They maintain that forecasting cannot be considered an assurance of logical conduct on the part of the weather.

◆ Furthermore, the bureau is a federal agency, and this fact mitigates against the private citizen's chances of collecting in court. At any rate, the bureau's own claim is that it has never paid off in an action involving a prediction.

◆ Its present goal is to improve its forecasting abilities with more thorough research in meteorology, better communications, and additional stations. The agency has $32 million in this year's budget, for an increase of more than $7 million over the fiscal 1955 funds, and was also granted $7.5 million to be spent over a four-year period in building facilities.

saved $222.82 per flash-welded ring!
USING AMERICAN WELDING SHAPES
Here is another American Welding mill-rolled section that is saving money for a leading manufacturer of jet aircraft engines. By forming and flash butt-welding a ring from this shape, a heavy and expensive casting is eliminated. On each ring 222 pounds of metal was saved and machining time cut in half. This added up to a whopping $143,718.50 saved on a single order — a typical example of what American Welding is doing for fabricators of circular weldments and may be able to do for you.
A special mill-rolled shape may be just the answer to your problem. Call or write today — American Welding's Industrial Products Division will be glad to work with you.
Ask for free Facilities Catalog. Find out what American Welding can do for you.
AMERICAN WELDING

No Quick Shift . . . Ten years from today American industry will still place primary reliance on coal, oil, and gas as sources of energy for production. Nuclear power, solar energy, and synthetic oil will help carry the work load in 1965, but they will be of slighter importance than the conventional fuels now in use.

Demand for petroleum products is to increase by about 4 pct per year, but changes in the type of product wanted can be expected. For instance, the market for liquefied petroleum gases, such as those used by the chemical industry and in farm machinery, probably will expand greatly.

Experts Speak . . . These are the carefully-judged opinions of minerals experts at the U. S. Interior Dept., who are appraising the national capacity to produce fuels adequate to meet vastly greater industrial and individual needs. As demand multiplies, these officials maintain, fuel suppliers are to step up their exploration, probing deep for profitable supply sources.

One result of the continuing official appraisal is an optimistic forecast of prospects for the coal industry. A 50 pct rise in the use of coal by domestic steelmakers in the next 25 years is expected.

Public Works Watch

Close watch is being kept on public works programs at all levels of government by Maj. Gen. John S. Bragdon, a retired Army engineer recently named by President Eisenhower as a special assistant.

If the thriving U. S. economy begins to show signs of a downturn, Gen. Bragdon is to advise the President on possible advantages of boosting the size and number of public works projects.

Army Research Chief

Role of research in modern warfare is emphasized by the appointment of Lt. Gen. James M. Gavin as new chief of research and development for the Army.

Since March of this year, Gen. Gavin had served as deputy chief of staff for plans and research. In his new post, he will be responsible for planning, reviewing, and carrying out scientific work of the service.

His activities will be correlated with those of William H. Martin, the civilian director of Army research and development. Gen. Gavin will report directly to the Army chief of staff.

Hoover Group Dies

Hoover Commission, formally dying just a day short of two years after it was formed, proved it could practice what it preaches —it returned $83,000 in unspent funds to the Treasury Department.

Commission, headed by former President Herbert Hoover, was formed to study ways of reducing unnecessary government expenditures and improving efficiency. In its two years, the group made 39 reports, totalling 3.3 million words, and came up with 314 recommendations, 145 administration and the rest requiring legislative action.

To date, some 50 administrations have been put into effect by the Eisenhower administration, one of which will save the government yearly four or five times the cost of the Commission's work, officials say.

"I don't think you realize this is the World Series! You're calling 'em just the way you did all season!"

WASHINGTON NEWS

Nickel Threatens TV

Shortage of nickel is pinching electron receiving tube manufacturers and may soon cause production and employment cutbacks, industry spokesmen tell the Business and Defense Services Administration.

Television and radio set production will also be slowed down if the tube production is cut back, the industry says. BDSA and the Defense Department are now computing mobilization requirements for receiving tubes, matching it against present capacity, so that any deficiencies can be corrected.

New Defense Planning

Keep your emergency plans flexible and be ready to move independently in case there's a surprise attack on the U. S., Defense Secretary Wilson tells the armed forces.

In a new directive, the defense chief gives the Army, Navy, and Air Force until Nov. 1 to draw up lists of actions which can be taken immediately if full mobilization is required. These actions must be possible in the absence of direct authority from Congress, there being no assurance that Congress will be in session when war begins.

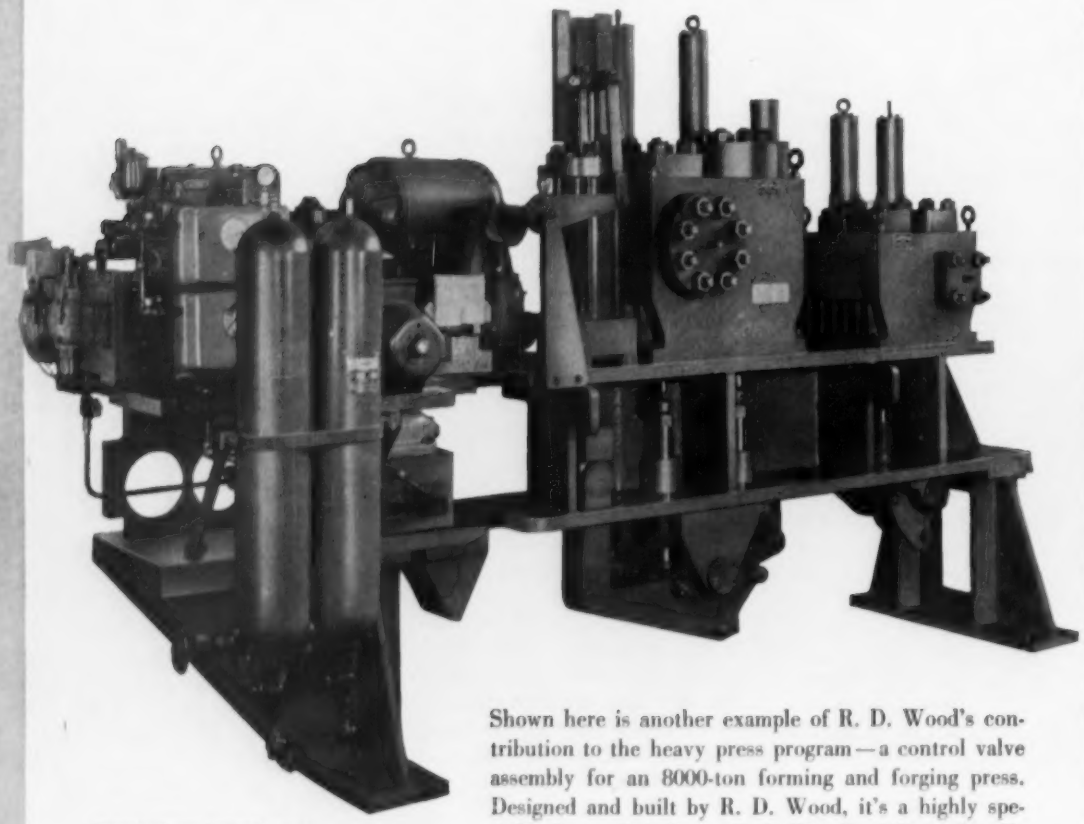
Petro Chemical Study

A new study by the Massachusetts Institute of Technology analyzes the factors affecting future geographic distribution of the petro chemical industry.

Study, prepared for the U. S. Commerce Department, presents a location analysis for each of the various petro chemicals, considering transportation costs for raw materials, fuels, and finished products, and the economics of plant size.

Copies of the study, "Location Factors in the Petro Chemical Industry," (PB 111640) are available from the Office of Technical Services, Washington 25, D. C. for $3.

Big help in heavy press program



Remote electro-hydraulic servo control valve assembly. Length is 14 feet; height 9 feet.

Shown here is another example of R. D. Wood's contribution to the heavy press program—a control valve assembly for an 8000-ton forming and forging press. Designed and built by R. D. Wood, it's a highly specialized type. It indicates R. D. Wood's ability to handle the most difficult valve engineering and manufacture.

Other standard R. D. Wood high-pressure hydraulic valves include stop, operating, check, relief, and safety types. Since 1803, the name R. D. Wood has stood for superior products. Write for details on R. D. Wood high pressure hydraulic valves for every purpose.

R. D. WOOD COMPANY

PUBLIC LEDGER BUILDING • PHILADELPHIA 5, PENNSYLVANIA

Representatives in Principal Cities

Creating a Do-It-Yourself Market

Seattle machinery dealer sets up school . . . Lessons result in purchases of hundreds of tools . . . New type titanium sheets replace smooth stock for some aircraft building uses—By *R. R. Kay.*

❤ DO-IT-YOURSELFERS are filing into classes of a "College of Power Tool Knowledge." Their training means: lots of new sales for the school's sponsor, a Seattle machinery dealer.

The idea's getting very popular. Doors open this week for the third year. The school is so successful that the company has to turn down eager applicants—can only handle 300 enrollees now. It's a good-sized student body any way you look at it. And all potential tool buyers.

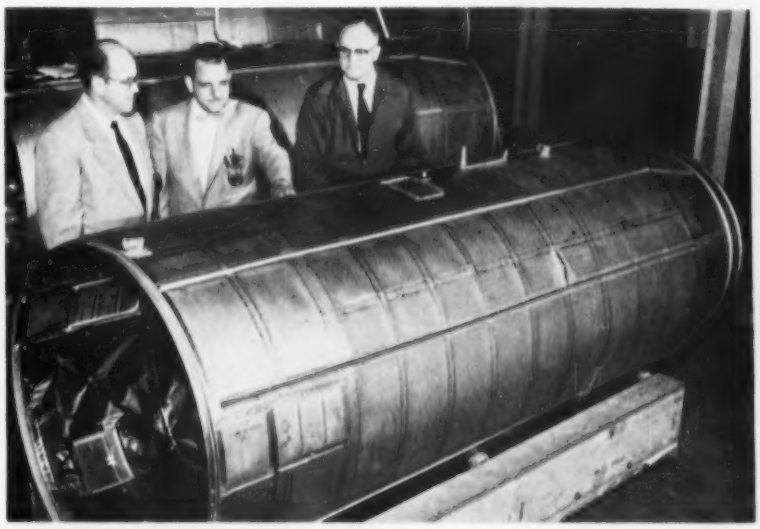
Here's how it works: You enroll in a fall or winter semester of eight Saturday night two-hour sessions. Curriculum is flexible—grows out of students' interests. Basic instruction is in use of: lathes, table saws, joiners, drill presses, scroll saws, paint spraying and air brush equipment.

National tool manufacturers often tie in with the school's program. Example: part of last year's schedule centered on the DeWalt radial arm saw. A DeWalt man taught the course.

School's sponsor, Star Machinery Co., doesn't try for any direct sales link. However, company treasurer James Funk says graduate do-it-yourselfers buy hundreds of tools. It's a big, new retail outlet for the company.

Informality is the by-word. Enrollees range from youngsters to retired people in their seventies. And women, surprisingly, make up 10 pct of the student body.

Aloha Steel . . . A steel mill in Aloha land? Honolulu is a good bet for a small semi-integrated steel mill installation.



NEW TYPE titanium shroud is used by Convair in jet construction. Dimpling surface makes skeet stronger and more rigid than smooth sheet.

Hawaii's Governor Samuel Wilder King points to:

(1) A long-term construction program: roads, tunnels, bridges, hotels, schools, commercial buildings.

(2) Hawaii's 40,000 to 50,000 annual tons of steel scrap—now exported.

It adds up to a likely spot for steel making. The idea's getting intensive study right now.

Titanium Sheets . . . New type titanium sheets — with rolled-in dimples and ridges—save weight, give greater strength, are more rigid.

The material is replacing smooth sheet stock now used for jet engine insulating jackets on U. S. Air Force F-102A supersonic interceptors.

Ridges and dimples, rolled in at the mill, form an overall pattern. Sheets are thinner than current-type stock but pattern makes them stronger. Use of seam and spot welds eliminates rivets, gives still more weight saving.

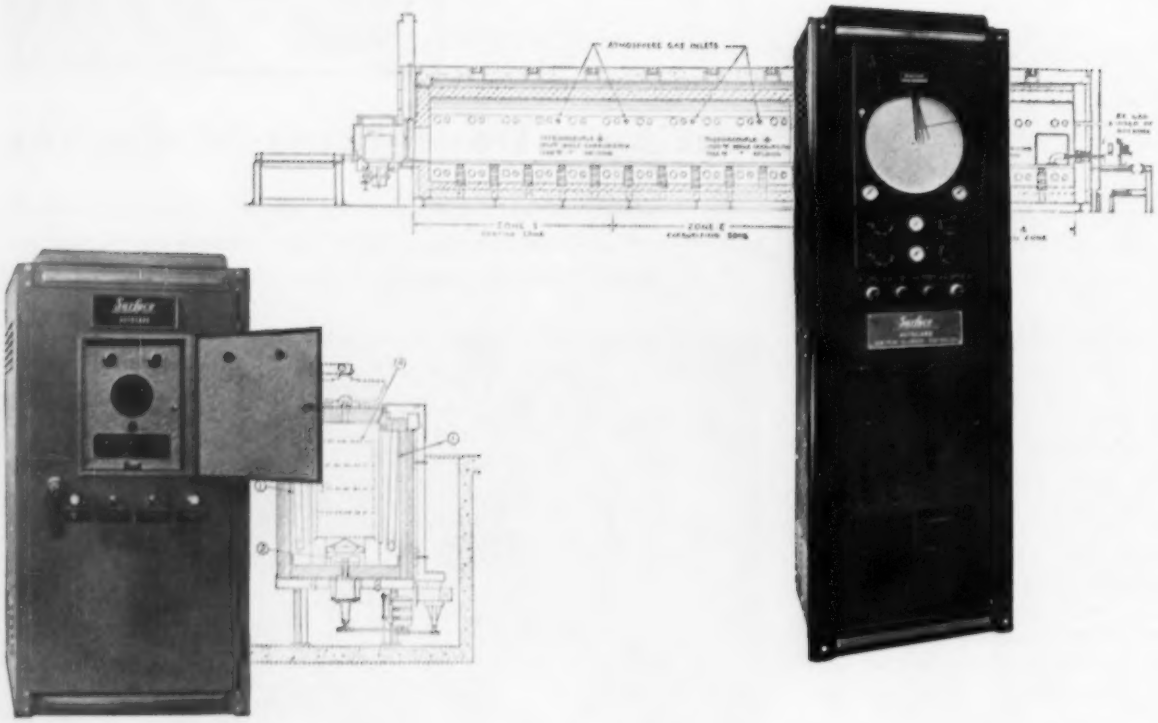
F-102A, first plane to get the new material, is in production at Convair Div. of General Dynamics.

More Aluminum . . . Aluminum market is expanding faster in the Farwest than in any other U. S. area. And it will continue to grow.

Pacific Northwest alone shows a 26 pct increase the past three years in aluminum end products fabricators. There are now over 500 companies in the business.

Kaiser Aluminum upped mill products shipments to western consumers by 117 pct.

See these Autocarb units in operation at the Metal Show . . . visit the 'Surface' Booth No. 304



now Autocarb* for any budget and application

Automatic carbon potential control is now available at low cost with the addition of the new signalling Autocarb controller to the 'Surface' dewpoint control systems.

You can have economical, automatic dewpoint control for your batch-type furnace, a specific zone of your continuous atmosphere furnace, or your gas atmosphere generator. Apply it to carburizing, clean hardening, annealing, and other processes.

Autocarb recorder-controllers provide up to six point control, and the new signalling Autocarb controller offers single point control for those applications where a permanent record is not required.

The Autocarb system minimizes human error in atmosphere control and reproduces any type of case curve. It gives you precise uniformity from piece to piece, automatically compensating for varying carbon demand by your work, and helps you meet tighter specifications.

write for Bulletin H55-13

Surface* HEAT TREATING EQUIPMENT

**Trademark of Surface Combustion Corporation*

SURFACE COMBUSTION CORPORATION, TOLEDO 1, OHIO
also makers of Janitrol automatic space heating and Kathabar humidity conditioning units

MACHINE TOOL HIGH SPOTS

Army Prepares for Quick Production

Korea finally taught the need for standby machines . . . Present program includes 150,000 machine tools in 400,000-piece reserve . . . Lines are kept intact at plant or in storage—*By E. J. Egan, Jr.*

◆ SEVERAL hundred officers in U. S. Army, Navy and Air Force uniforms were among the most interested visitors at the Machine Tool Show in Chicago last month. They were curious about application of the latest, best, most efficient tools in three areas they're responsible for:

(1) Preparation and planning for substituting the most effective tools in standby lines that would be activated in case of war.

(2) Integration of better tools in current military goods production lines.

(3) Setting up production lines for new items that are continually being added to the U. S. arsenal of weapons.

Tells Why . . . Presence of the military men in Chicago was explained by General Williston B. Palmer, Vice Chief of Staff, U. S. Army, in an address to members of the American Machine Tool Distributors' Assn.

General Palmer traced some past history for his audience, cited the record of the nation going to war three times in the 20th century with practically no war production base in existence.

He said it certainly wasn't the machine tool industry's fault, implied that the hair shirt for the triple error could most likely be worn by the public. It was public opinion, public pressure and lack of public education that caused 900,000 machine tools, acquired by the armed forces in World War II, to be thrown on the market.

Wrecked Industry . . . The big demand was to get the civilian economy restored, but it "wrecked the machine tool industry and the armed forces war reserve with one and the same monkey wrench," Gen. Palmer said.

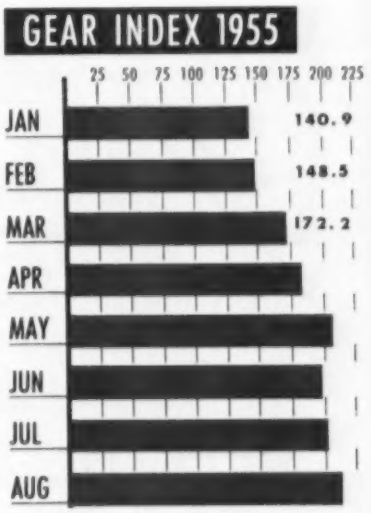
But he added, "I believe that the Korean War and the commotion about ammunition in 1953 had a very marked effect; because now for the first time the Army is being allowed to place its production equipment in reserve for a war emergency."

Outlining the Army's standby program, the general said its core is 400,000 pieces of production equipment. At least 150,000 of these items are machine tools. Intention is to retain and store the greater part of this equipment, packaged in integrated production lines. About half of it has already been put away, and there are three techniques for doing this.

Leave Intact . . . One is to leave the integrated production lines in place, under power, in a plant. The General described it as turning the key in the door and going back once a month or so to warm up the machinery, just to keep everything in working order.

The second technique is to store an integrated production line right at the plant where it will be used, but not to keep it under power. Instead it is pushed over to a wall or stored outside the plant in a Quonset hut so the management can put it to work in a hurry.

With the third technique, an entire production line is kept intact at some Army storage center. Such lines are usually earmarked for a particular civilian firm and would be shipped to that use site in a wartime emergency. These Army depots also store tools which are not part of a specific production line but are universally useful.



Base: 1947-49 = 100
Source: American Gear Manufacturers Assn.

Cite Drawbacks . . . The General granted that tools stored in these three programs might not be as fast and efficient as new ones.

But they will work; that has been proven on trial runs for weapons that will be needed if war comes. And they'll do a creditable production job in that all-important first war year, during which time orders will be placed with builders for a steady stream of the very latest equipment.

To keep abreast, to be in readiness to place the right kind of orders—these are the reasons the military men showed up in Chicago to see what's going on.

Controlled...every step of the way

VANCORAM FERROCHROMIUM

MINING

MILLING

SMELTING

RESEARCH

The high-quality standards for which Vancoram Ferrochromium is well known are made possible by complete integration and careful control of every step of the process, from mine to finished product.

To insure our customers a steady and continuing source of supply, we have stepped up the expansion and development of high-grade metallurgical chrome ore at our mines and mills.

There is a type and grade of Vancoram Ferrochromium for every application... stainless steels, tool steels, constructional alloy steels—and for use by the iron foundry. VCA's experienced Research and Technical Service Staff is working constantly at our modern Research Center, at our plants and in the field to improve product quality and to help customers in the proper application of Vancoram products to their processes.

Call your nearest Vanadium Corporation office for prompt, efficient service.

VANADIUM CORPORATION OF AMERICA

420 Lexington Avenue, New York 17, N. Y.

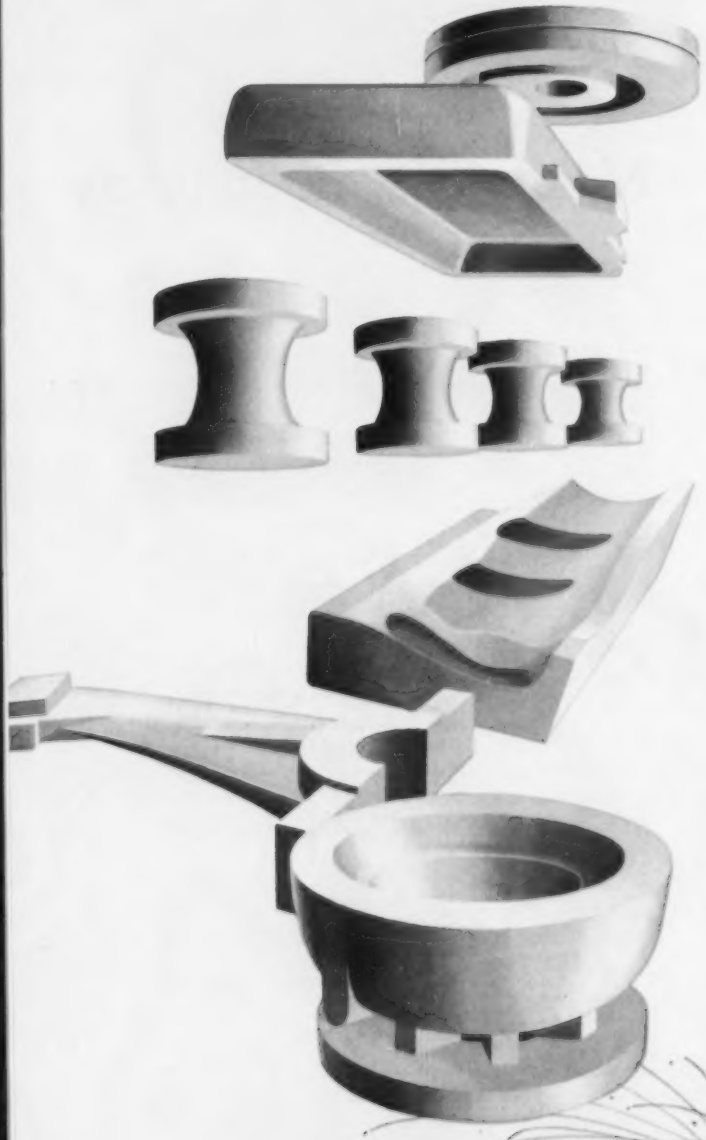
Pittsburgh • Chicago • Detroit • Cleveland

VANCORAM

Producers of alloys, metals and chemicals

Be sure to visit VANCORAM Booth 816—METAL SHOW—PHILADELPHIA—Oct. 17-21

You save time and money with fine JESSOP cast-to-shape steels



If you employ the use of dies, forming tools, gauges, cams, rolls, or numerous other similar products, you'll find you save time and money by having these tool steel requirements cast-to-shape by *Jessop*. *Play us on your team*, and discover that the tool steel shapes we ship to you answer your most exacting physical and metallurgical needs and necessitate, at the most, a bare minimum of finishing. Also, you will come to know that doing business with the Cast-To-Shape Division of *progressive, fast-growing Jessop* is a pleasant, as well as profitable, experience. There are no *neophytes* or *complacent* steel men here. In the foundry, the laboratory, and the research department are highly-skilled men who take pride in their work. They get *good* customers and *keep* them by turning out sound, uniform, close-tolerance castings quickly. Become a *Jessop* customer, yourself, and find out.

STAINLESS STEELS • HIGH SPEED STEELS • NON-MAGNETIC STEELS • HIGH SPEED TOOL BITS • HEAT RESISTING STEELS • STAINLESS-CLAD PLATES CARBON AND ALLOY STEELS • TOOL STEELS FOR SPECIAL PURPOSES CAST-TO-SHAPE TOOL STEELS • HIGH SPEED AND ALLOY SAW STEELS TEMPERED AND GROUND STRIP STEEL • COMPOSITE HIGH SPEED STEELS STAINLESS AND HEAT RESISTING CASTINGS • COMPOSITE DIE STEEL SECTIONS • PRECISION GROUND FLAT STOCK DIE STEELS—HOT AND COLD WORK

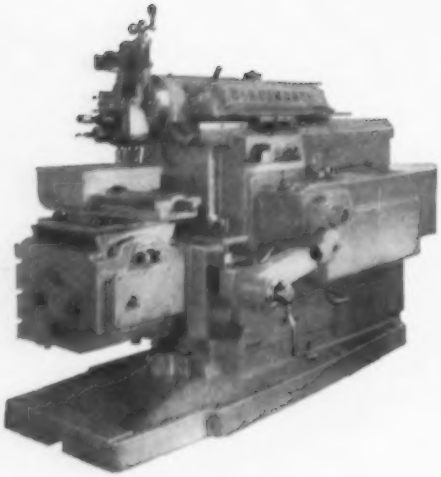
JESSOP

STEEL COMPANY • WASHINGTON, PA.

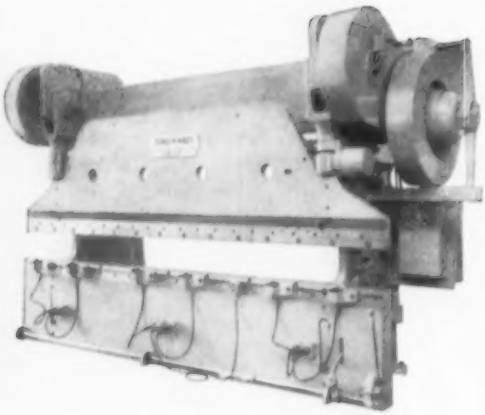
OFFICES IN PRINCIPAL CITIES

Jessop Steel of Canada Limited, Wallaceburg, Toronto

Jessop Steel International Corp., Chrysler Building, New York, New York



Important Announcement to the Metal Working Industry

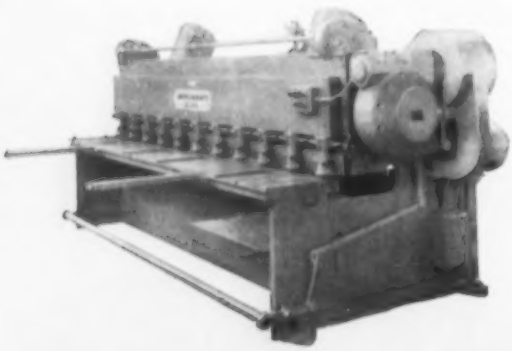


The Cincinnati Shaper Company

announces a

5 Year Guarantee

on material and workmanship on all new machines shipped after September 1, 1955. This guarantee is evidence of the unusual dependability of our machines.



THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

CINCINNATI

PERSONNEL

The Iron Age

SALUTES

Adolph O. Schaefer

His election as president of American Society for Metals is fitting recognition of a friendly man who has served metalworking over 30 years at company, industry and national levels.

Election of Adolph O. Schaefer as president of American Society for Metals for the 1955-56 term climaxes a long career of metalworking service. He takes office Oct. 19.

Vice president-executive assistant at The Midvale Co., Nicetown, Pa., Mr. Schaefer entered the metalworking field over 30 years ago, has worked effectively since that time on company, industry and national levels. With Midvale, he advanced from a job as research metallurgist in 1922 through a succession of engineering and production posts, becoming vice president in charge of engineering and manufacturing in 1951, assuming his present title in 1954.

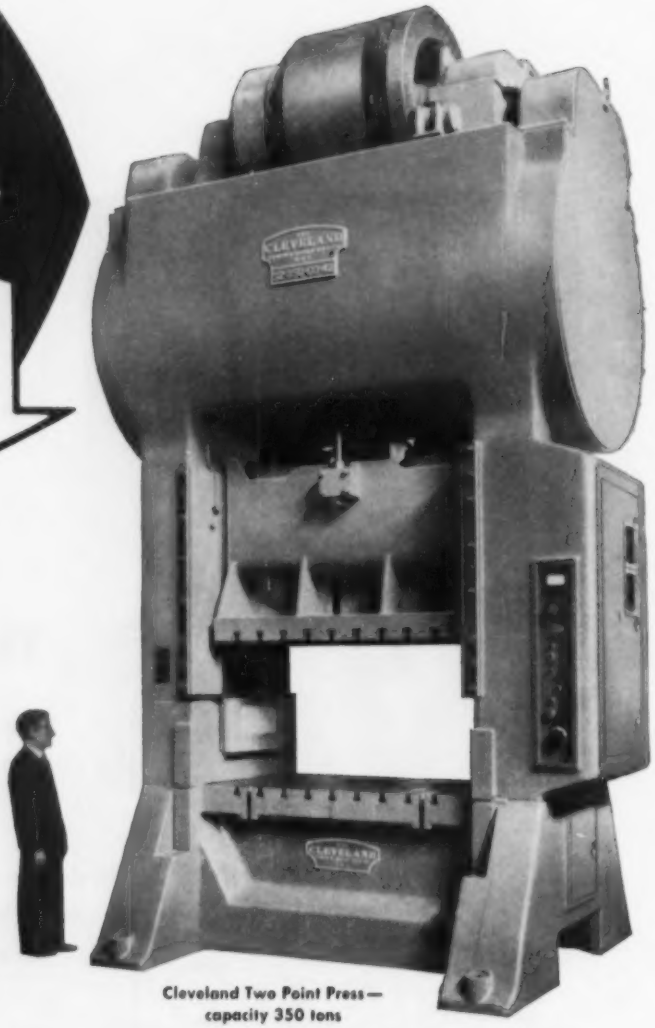
Mr. Schaefer has been secretary, treasurer, chairman, and director of ASM's Philadelphia chapter, was named Delaware Valley Metals Man of the year by the chapter in 1954. He served on the handbook, publications, nominating and other national ASM committees; was trustee and vice president of the organization prior to his election to the top post. In the Forging Manufacturing Assn., he has served as chairman of the metallurgical and research committee. During his time in this job, he prepared a manual on open die forgings.

Mr. Schaefer's record of national service is equally impressive. During the war and prewar periods, he was on the Army Ordnance metallurgical advisory and gun committees. Since the war he has been a member of the metallurgical advisory committee for guns. Wartime service included work on the War Production Board's industry advisory committee, the super alloys committee, and the joint British-American metallurgical mission.

Mr. Schaefer is a friendly man whose interest in promoting technical knowledge extends to college circles. He has been active in alumni affairs of his school, University of Pennsylvania; has been a leader in college fund raising drives.

He is married, has 2 children, lives in Norristown, Pa.—30 minutes from the Midvale plant. He devotes time to a small fruit orchard, takes delight in his daughter's equestrienne skill.

One Press or a Battery



Cleveland Two Point Press—
capacity 350 tons

planned press replacement cuts your production costs!

In the face of rising labor costs your best solution to increased competition is more efficient production.

New, more efficient presses will cut your stamping costs and turn out a better product. It will pay you to analyze your present press lines. Worn, inefficient presses can be costing you money. Make an operating cost comparison of present vs. new equipment. This will give you a true picture of new press cost.

Won't you let us give you the complete Cleveland story? Our 11 types of modern Cleveland Presses assure stamping economy. Just write or call today.

THE CLEVELAND PUNCH & SHEAR WORKS CO.

Established 1880

POWER PRESSES

FABRICATING TOOLS

1880 75 1955 YEARS OF CONSTANT PROGRESS

Diamond Anniversary

E. 40TH & ST. CLAIR AVENUE • CLEVELAND 14, OHIO

Offices at: NEW YORK • CHICAGO • DETROIT • PHILADELPHIA • E. LANSING • OXFORD, O.

CITY FOUNDRY DIVISION SMALL TOOL DEPARTMENT

The Iron Age INTRODUCES

L. W. Mercer, appointed senior vice president and secretary; **James S. Vaughan,** vice-president, Distribution Equipment Div., and **T. R. Oakes,** appointed treasurer and assistant secretary, **Square D Co.,** Cedar Rapids, Iowa.

C. Irwin Hochhaus, appointed as plant manager, Penco Metal Products Div., **Alan Wood Steel Co.,** Conshohocken, Pa.

Robert B. Murray, Jr., promoted to vice-president and member of the board of directors; **James M. White,** elected vice-president, manufacturing, and **Colonel John R. Martin,** named vice-president in charge of electronics and instrumentation operations, The **Baldwin-Lima-Hamilton Corp.,** Philadelphia.

Peter H. Stanton, elected vice-president and treasurer and member of executive committee, **Topp Industries Inc.,** Los Angeles.

Francis T. Thorley, appointed assistant sales manager, **Hy-Pro Tool Co.,** New Bedford, Mass.

Carroll Victor Roseberry, appointed manager, and **Dr. William E. Shoupp,** appointed technical director, commercial atomic power activities, **Westinghouse Electric Corp.,** Pittsburgh.

H. M. Giefer, appointed factory representative, Minn.-Wisconsin, Wire Products Div., **Union Steel Products Co.,** Albion, Mich.

Willard R. Richards, appointed control supervisor; **R. E. Goodman,** named quality supervisor; **Forrest W. Johnson,** appointed plant metallurgist, and **Raymond F. Zeller,** appointed chief inspector, **American Welding & Manufacturing Co.,** Warren, O.

Arthur L. Thomas, appointed sales representative Eastern-Northern New York, and **Richard G. Reilly,** named sales representative Western New York, **A. B. Murray Co., Inc.,** McKeesport, Pa.

Bertrand Y. Auger, appointed technical director, Reinforced Plastics Div., **Minnesota Mining & Manufacturing Co.,** St. Paul, Minn.

Edwin B. James, appointed assistant sales manager, **McKay Machine Co.,** Youngstown, O.

Darius R. Barber, appointed controller, **Brush Electronics Co.,** Cleveland.

Henry B. Williams, appointed manager of sales, New York area steel service plant, **Joseph T. Ryerson & Son, Inc.,** Chicago.

D. I. BROWN, appointed assistant to the president, Washington Steel Corp., Washington, Pa.

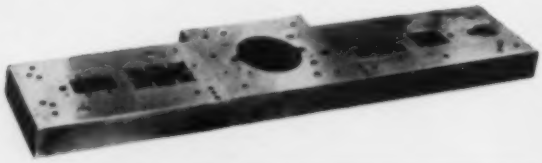
C. GEORGE DANDROW, appointed vice president-customer relations, Johns-Manville Corp., New York.

ORRIN W. BARKER, elected vice president, engineering, Kearney & Trecker Corp., Milwaukee.

RUSSELL B. CAPLES, elected vice president, metallurgical operations, The Anaconda Co., New York.

How to Know BEFORE DELIVERY

What Results You'll Get from the TOOL AND DIE STEELS You Order



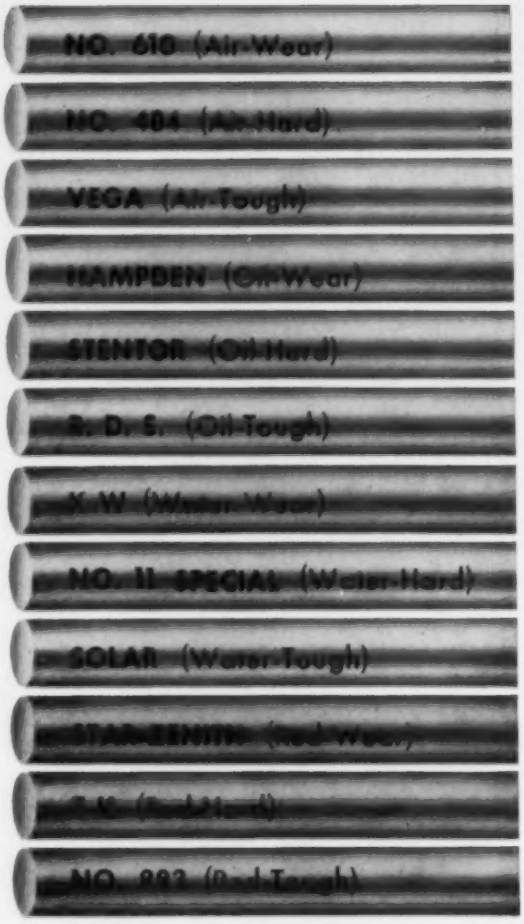
Maximum performance from your tools and dies is possible *only* when your design, toolmaking and heat treating are backed by sound, top quality tool and die steels. You control the first *three factors*. But how can you be sure, *before delivery*, that the die steels you order will deliver the *results* you want?

To give you this assurance, Carpenter puts its "mark" on *every* grade of die steel it produces. This mark, or brand name, is the sign of *consistent Carpenter quality*.

In back of it, at Carpenter, is a long list of painstaking controls. These include Hot Acid Etch Inspection, Ultrasonic Testing, Tough Timbre and Hardenability Testing. And that's only the start of many *extras* you get with Carpenter brands of tool and die steels . . . extras that enable you to predict *in advance* results you'll get on the job!

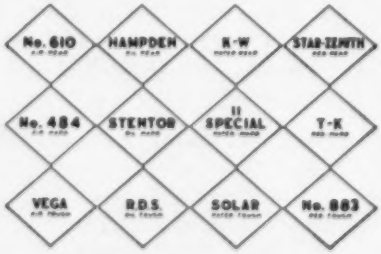
Accurate selection is one example. With the Carpenter-pioneered Matched Set Method your men take the guesswork from choosing the one steel best suited to the job. *Trouble-free heat treating* is another. Through tests and controls, Carpenter has simplified the heat treatment of Matched Tool and Die Steels beyond anything previously known. Further, a wealth of printed information gives you a "blueprint" to minimize costly heat treating hazards.

All this . . . and more, stands behind every bar of Carpenter Matched Tool and Die Steel. So, when you see any of these Carpenter brand names, you can feel *safe* in the knowledge you're getting *full value* from your investment. Specify Carpenter Matched Tool and Die Steels. It costs you no more to be *sure!*

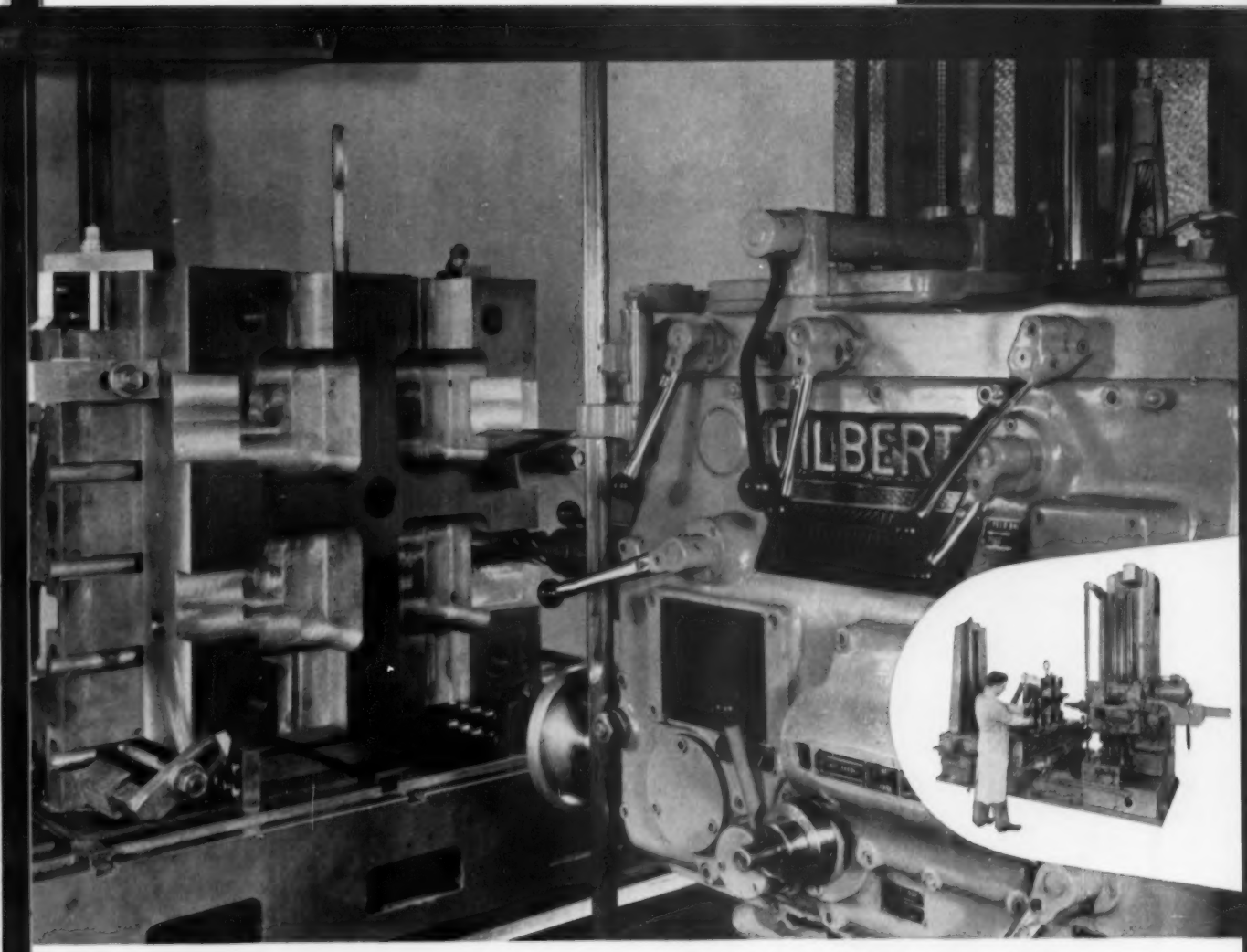


And each bar is colored *full length* with a distinctive color for each grade. Here's *positive* identification!

Carpenter STEEL — Matched Tool and Die Steels



Export Department: The Carpenter Steel Co., Port Washington, N.Y.—"CARSTEELCO"
THE CARPENTER STEEL CO., 121 W. Bern St., Reading, Pa.
Mill-Branch Warehouses and Distributors in Principal Cities Throughout the U.S.A. and Canada



courtesy Mohawk Tool & Die Corporation and Macauley Machinery Co.

30 percent savings and ±.001"

. . . match it with a Gilbert

How's this for a perfect lineup: 30% savings in floor-to-floor time over previous machines, and ±.001" for mating the two chases of a four-cavity carburetor bowl mold.

Mohawk Tool & Die Corp., Rochester, N.Y., gets these savings and accuracy by handling the job on a Cincinnati Gilbert horizontal boring mill.

Here the lower chase (of hot work die steel) is being rough machined. Then it's hardened to a Rockwell of 48-50C scale. Finally, the chase is finish machined with carbide to an accuracy of ±.001" for guide pin and bushing holes, four cavity pockets, and eight slide ways.

Says Mr. George Neward, Mohawk's Secretary-Treasurer: "This job illustrates the flexibility of this type of machine. The ruggedness and stability of the Cincinnati Gilbert has been proven to us without doubt."

The comparatively low cost of adding these advantages to your operations will surprise you. Write for new literature, or—better yet—get a proposal from Gilbert now.

The Cincinnati Gilbert Machine Tool Co.,
3366 Beekman Street, Cincinnati 23, Ohio

those who buy Gilbert buy **GILBERT** *again*

William West, appointed sales engineer, and **Donald M. Bristol,** named office manager, San Francisco Div., **Connor Spring Manufacturing Co.,** San Francisco.

Edwin H. Stricker, appointed administrative assistant to **J. E. Timberlake,** vice-president sales, **Jones and Laughlin Steel Corp.,** Pittsburgh.

Harold Howe, elected secretary, **American Smelting & Refining Co.,** New York.

Earl N. Stone, appointed sales engineer, **Edward Valves Inc.,** E. Chicago, Ind.

Neil A. Baer, appointed application engineering specialist, **Vickers Inc.,** Detroit.

Andrew M. Coventry, appointed credit manager, Laclede-Christy Co., Div., **H. K. Porter Co., Inc.,** Pittsburgh.

John P. Borda, appointed general manager, Magnus Metal Div., and **Edward M. Van Winkle,** elected president, Magnus Metal Corp., **National Lead Co.,** New York.

P. T. Lagrone, appointed manager electric utility sales, **Westinghouse Electric Corp.,** Pittsburgh.

Sam C. Mitchell, appointed western div., sales manager, Chrysler Div., **Chrysler Corp.,** Detroit.

William R. McFarland, elected president and general manager, **Atlantic Compound Co.,** Waterbury, Conn.

Theodore F. Smith, Pittsburgh, appointed industry consultant, Kaiser Engineers Div., **Henry J. Kaiser Co.,** Oakland, California.

Alastair Grant, appointed vice president **Trebor Mines Ltd.,** Montreal.

C. JAY PARKINSON, elected vice president, Anaconda Aluminum Co., New York.

DR. ROBERT M. BRICK, appointed director, Dept. of Metallurgy, Continental Can Co., New York.

RALPH C. MOFFITT, appointed assistant vice president and director of purchases, U. S. Steel Corp.

DR. JOHN C. HAMAKER, appointed manager, Research Dept., Vanadium-Alloys Steel Co., Latrobe, Pa.

HOW GREAT LAKES CARBON CORPORATION

"QUENCHES ITS COKE" with a Plymouth Locomotive

"Quenching coke" is a fascinating step in the production of high quality foundry coke. Red hot coke is pushed out of the ovens into the steel quencher car. The car is then run beneath the quencher tower and water is sprayed on the glowing coke, making a spectacular steam cloud.

At the St. Louis, Mo., Merchant Coke plant of Great Lakes Carbon Corporation, the quenching operation never ceases . . . and the 25-ton Plymouth Locomotive, with special raised cab for maximum visibility over the quencher cars, is in operation 24 hours a day, 7 days a week, with only time out for routine maintenance! Another powerful Plymouth, a 50-ton DE, works a double shift, 70 hours a week, switching coal and coke cars over the company's 7 miles of track. The operators like the simple operation, the dependable, continuous service they get from Plymouth, and this reliability is reflected in operational savings.

Find out how Plymouth performance can give you the same satisfaction, economy, and dependability on all your hauling jobs. Write today for information. Models from 3 to 70 tons. Gasoline or Diesel, mechanical or Torqomotive Drive. Also Diesel-Electrics. Plymouth Locomotive Works, Division of The Fate-Root-Heath Company, Dept. A-2, Plymouth, Ohio.

PLYMOUTH® TORQOMOTIVES

Torqomotive Drive:—Plymouth transmission coupled to a Hydraulic Torque Converter.

WHERE HAVEG

TRADE MARK REG. U. S. PAT. OFF.

EQUIPMENT IS INSTALLED

PICKLING, PLATING,
DEGREASING TANKS
BASKETS • PIPING • VALVES
AGITATORS • PUMPS
FUME DUCT
BIFURCATORS • HOODS

Metal Finishing Corrosion has been Controlled!

All Haveg equipment has extra long life, extreme resistance to corrosive chemicals, and can be used continuously in a high range of process temperatures with complete safety and a proven history of performance.

Because Haveg corrosion-resistant tanks prevent specking or flaking of the finished product, the number of rejects is reduced and the plating job is uniform. Solutions do not build up on Haveg, thereby clean-up time is reduced.

Molded Haveg tanks are made in a single piece construction. Any size, style, baffle arrangement can be supplied to fit your process. Equipment is virtually tailor-made for longer service life, improved production.

Remember, Haveg is not a coating or tank lining. It is a moldable rigid plastic material, made from acid-digested asbestos and synthetic resins specially selected for difficult service with practically all acids and salts, chlorine, many solvents. Throughout its entire mass, Haveg is resistant to practically all solutions used for finishing metals. Its long life is not a claim, but a fact proven in hundreds of installations.

Haveg can help you make your finishing operations more profitable and less subject to the waste of corrosion. Call the sales engineer listed and write for 32-page Bulletin C-12 which shows tank sizes, shapes, chemical ratings . . . the complete Haveg story.

ATLANTA 5, Exchange 3821 • LIVONIA, MICH., Kenwood 1-1785
CHICAGO 11, DElaware 7-6088 • HOUSTON 4, Jackson 6840
CLEVELAND 20, Washington 1-8700 • LOS ANGELES 14, Mutual 1105
WESTFIELD, N. J., Westfield 2-7383

HAVEG CORPORATION

TRADE MARK REG. U. S. PAT. OFF.

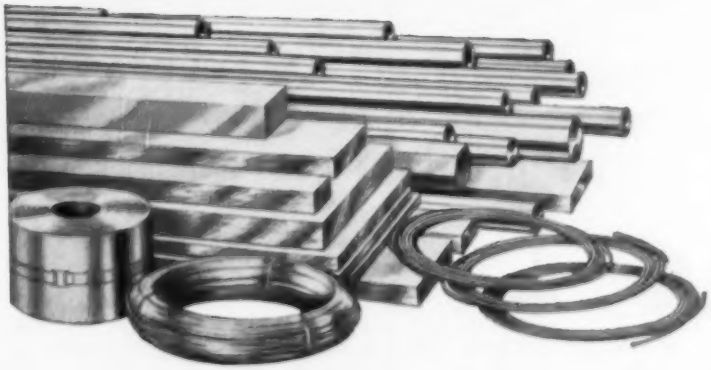
900 GREENBANK RD., WILMINGTON 7, DEL., WYman 8-2276

OLD FRIEND!

CHASE

Since 1876, the name Chase has been the symbol of *top quality in brass and copper.* It also stands for unmatched *service!* Twenty-five Chase warehouses and three Chase mills form the most responsive and efficient source of brass and copper supply in the nation!

NEW SERVICE!



Now the Chase network assures you a dependable source of stainless steel, too! You specify the type, form and quantity. The Chase warehouse near you has it in stock—or will get it to you on the double, direct from another Chase warehouse or the mills. Call Chase today! Get those service experts working for *you* on your stainless steel requirements!

STAINLESS STEEL!

Chase®

BRASS & COPPER CO.

WATERBURY 20, CONNECTICUT • SUBSIDIARY OF KENNECOTT COPPER CORPORATION

The Nation's Headquarters for Brass & Copper

Albany†	Chicago	Detroit	Los Angeles	New Orleans	Rochester†
Atlanta	Cincinnati	Grand Rapids†	Louisville†	New York	St. Louis
Baltimore	Cleveland	Houston	Milwaukee	Philadelphia	San Francisco
Boston	Dallas	Indianapolis	Minneapolis	Pittsburgh	Seattle
Charlotte†	Denver	Kansas City, Mo.	Newark	Providence	Waterbury

(†sales office only)

going...

going...

SEND TODAY for Kester's new 78-page informative textbook "SOLDER . . . Its Fundamentals and Usage."

gone!

Constant solder alloy control and consistent flux formulae combine to make Kester Flux-Core Solder the type of production "tool" that wins great popularity. And such popularity means a full spool of Kester disappears in a hurry because it's practical to use on every soldering operation.

KESTER SOLDER

COMPANY 4215 Wrightwood Avenue, Chicago 39, Illinois

Newark 5, New Jersey • Brantford, Canada

C. E. Reid, named small business liaison officer, **Republic Aviation Corp.,** Farmingdale, N. Y.

Jack W. Gleeson, appointed Kansas City regional manager, Chrysler Div., **Chrysler Corp.,** Detroit.

R. E. Cassatt, appointed manager, commercial sales, **York Corp.,** York, Pa.

George R. Trumbell, appointed general sales manager, **Westfield Manufacturing Co.,** Westfield, Mass.

Russell R. Bryan, Jr., appointed consulting mining engineer and geologist, **Barium Steel Corp.,** New York.

Thaddeus Giszczak, appointed factory manager, and **Paul B. Guilford,** named chief metallurgist, Central Foundry Div., GMC, Defiance, O.

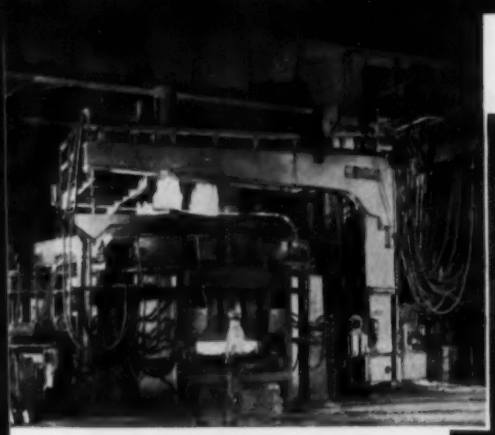
Robert B. Anderson, elected president **Ventures Limited,** Toronto.

Ralph E. Pettit, named technical advisor, Metal Industries Dept., **The Diversey Corp.,** Chicago.

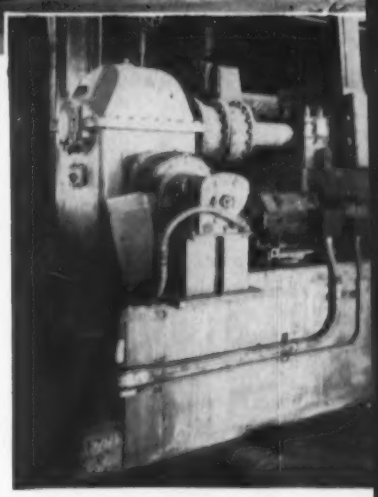
William M. Smith, appointed Sales Div., Philadelphia; **William C. Schneider,** appointed to New York City-North Jersey area; **Kenneth E. Rasmussen,** appointed sales representative, Rochester, N. Y.; and **Harry E. Morton,** named sales representative, Chicago, **Selas Corp. of America,** Philadelphia.

Delmar Landen, appointed vice-president, sales, and **Wilbur Weise,** named assistant vice-president, sales, **Beaver Tool & Engineering Corp.,** Royal Oak, Mich.

John E. Hawley, appointed to Technical Service Dept., Chemical Specialties Div., **Pennsylvania Salt Manufacturing Co.,** Philadelphia.



Shown above is a 20′ diameter shell Top-Charge Heroult Furnace. At right, the same furnace is shown with swing-type roof removed for charging. Smaller picture at lower right, shows tilting mechanism for 20′ diameter Heroult.



Heroult Electric Furnaces for faster, high quality steel making - -

To keep pace with modern steel making methods . . . to produce better quality steel faster, and more economically, it will pay you to consider the addition of electric furnaces to your existing facilities.

In the light of the experience of some of the nation's most successful mills, Heroult Electric Furnaces should easily prove a big time and labor saver, *and quality up-grader* for you.

Embodying the latest in mechanical and electrical equipment, these widely used furnaces are noted for their efficient performance, and low operating and maintenance costs.

Available in sizes of shell diameter ranging from 7′0″ up to 24′6″, and with rated charge capacity of from 8000 lbs. up to 400,000 lbs. They are usually equipped with roof-moving mechanism to permit top charging. Both gantry and swing-type roof-moving mechanisms are available. Door-charging furnaces and furnaces of special design, including units equipped with austenitic steel bottoms to permit inductor stirring, can also be supplied.

We welcome an opportunity to help you select and install the Heroult Electric Furnace best suited to your particular requirements.

THIS CATALOG

contains up-to-date information on Heroult Electric Furnaces — types, sizes, capacities, rating, etc. For free copy, write to our Pittsburgh office.

AMERICAN BRIDGE DIVISION

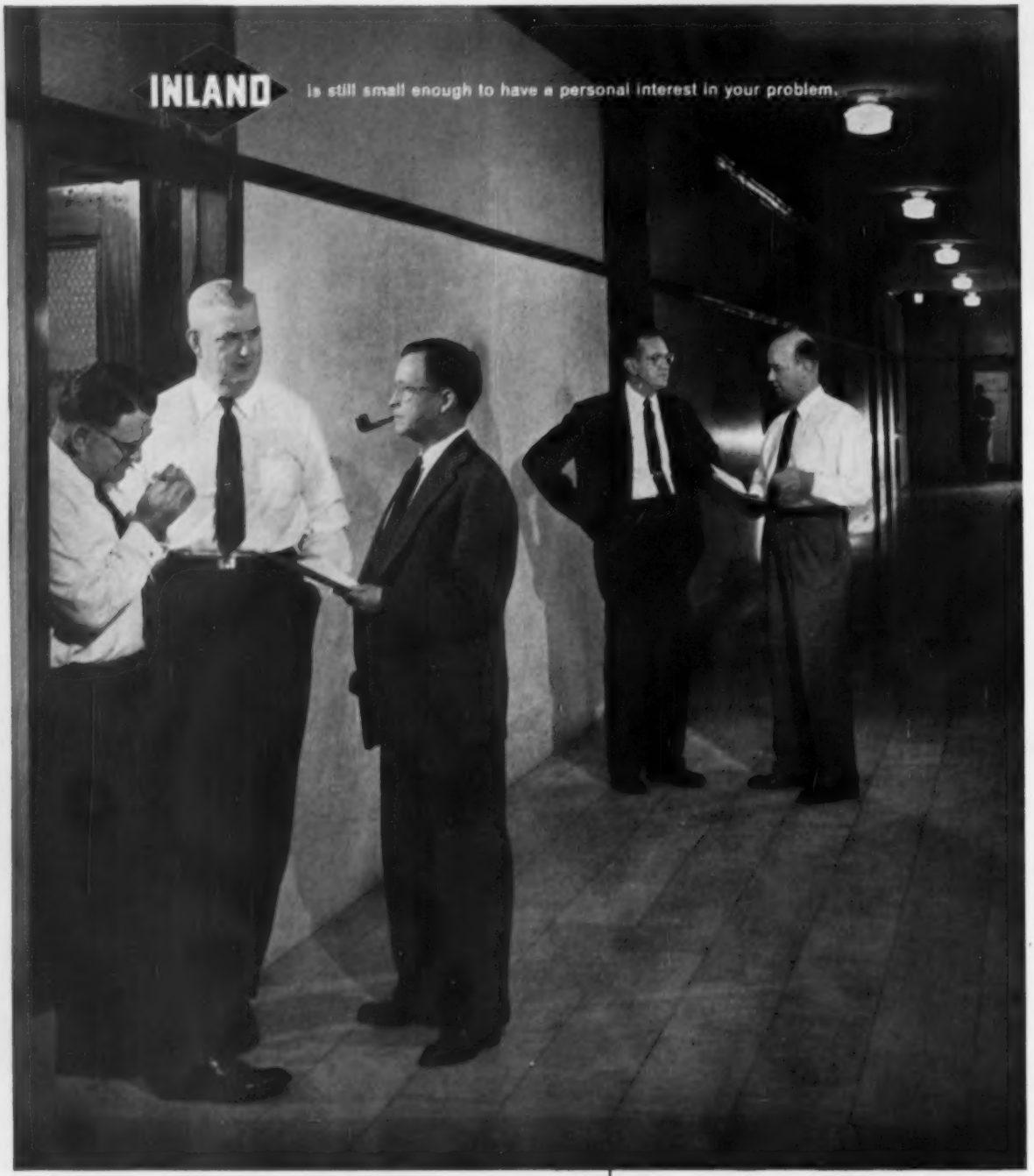
UNITED STATES STEEL CORPORATION, GENERAL OFFICES: 525 WILLIAM PENN PLACE, PITTSBURGH, PA.

Contracting Offices in New York, Philadelphia, Chicago, San Francisco and other principal cities.

United States Steel Export Company, New York

USS

UNITED STATES STEEL



Why you can get quick action on steel-making questions at Inland

When your steel problem needs a prompt answer, you can get it at Inland where all the men who make decisions are quickly available. Like the top men in sales, steel manufacturing, quality control, raw materials and traffic pictured here.

INLAND STEEL COMPANY
38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: Chicago • Milwaukee • St. Paul
Davenport • St. Louis • Kansas City • Indianapolis
Detroit • New York

Principal Products: Sheets • Strip • Structural Shapes • Plates • Bars • Tin Mill Products • Rails and Track Accessories • Coal Chemicals

SPECIAL METAL SHOW FEATURE

How to get more for your steel dollar

the Iron Age

How To Get More For Your Steel Dollar

GETTING THE MOST FOR THE STEEL DOLLAR is a major challenge to almost every metalworking plant. To meet it successfully, close cooperation between purchasing, production and engineering is needed. Their combined efforts can result in an improvement in product quality as well as substantial cost savings.

Efficient purchasing and use of steel depends upon two basic rules. 1. Keep steel extras to a minimum. 2. Select steels best suited to both the processing and end use of the product.

With this in mind, The Iron Age called upon the purchasing and production departments of both large and small users of steel. This feature, based on many years of first hand experience, can help make your job of steel buying and processing easier—and above all—more profitable.

Section 1

Purchasing:

Sheet and Strip——p. 191
Bars and Shapes——p. 193
Working Tolerances——p. 196
Heat Treating for P.A.'s——p. 197

Section 2

Processing:

Materials Inspection——p. 198
Heat Treat Control——p. 199

HOW TO GET MORE FOR YOUR STEEL DOLLAR

SECTION 1

Drawing Quality

Surface Finish Extras

Cold Rolled v. Hot Rolled

Chemistry Extras

Plain Carbon v. Alloy

Working Tolerances

Heat Treatment

Purchasing

Sheet and Strip

◆ QUALITY FACTORS for buying sheet and strip differ greatly from those usually applied to bar stock and structural shapes. With sheet and strip, prime considerations are drawing and forming quality, surface finish and general performance in processing.

These and other special qualities are listed by steel producers as "extras." As a cost-conscious buyer, you must strike a delicate balance between the various "extras" available and the quality requirements needed in the fabrication and operation of your product.

Quality is itemized and defined in the specification agreed to by both buyer and seller at the time the steel is ordered. A purchasing agent for a prominent electrical equipment manufacturer recently summarized his view of the quality vs. cost balance typical of a well prepared steel specification. Such a specification, he said, is written with a list of product requirements in one hand and a check list of steel extras in the other.

Remember that ultimate success in purchasing must integrate product requirements and the cost of extras. Experienced purchasing men refer to this profit-making combination as "value analysis buying." When neither product nor shop process is adversely affected by cost cropping, the fewer the extras the more successful is the integration on the part of the purchaser.

This same purchasing agent during a routine check, discovered that he was paying for a surface finish extra he really didn't need. The end product was a simple, out-of-sight panel. Its surface finish requirements were anything but critical. By eliminating the surface finish extra, he gained an immediate saving of about $7,000 in one year.

Further checking showed that a thickness tolerance, long since antiquated by die improvements, could be appreciably widened without hurting either the end product or the simple bending operation involved in its fabrication. Broadening this tolerance resulted in the appreciable saving of $15 per ton of sheet.

You can incur about twenty possible types of extras when you buy steel sheet and strip. All hinge to either quality or quantity requirements. Multiply this basic twenty by the number of different lengths, widths, and thicknesses in common use. Depending upon the limits of your patience, you'll be counting extras by hundreds—then by thousands.

When reviewing the "extra" problem, pay particular attention to such items as gage and width, length, restricted thickness, item quantity, stretcher level standard, forming, heat

"...he was paying for a surface finish extra he really didn't need..."

treatment, restricted chemical requirements, and packing and marking.

Dropping any one of these extras results in an appreciable saving, especially when large quantities are involved. Remember too, that buying in larger quantities can often eliminate a quantity extra.

What about drawing quality?

The general problem of "drawing quality" certainly warrants your careful study. Drawing quality usually defines the formability of sheet and strip. It has been classified under a number of grades, each of which applies to the making of the basic steel or its later processing. These grades are: 1—commercial quality, 2—drawing quality, and 3—drawing quality—special killed steel.

Commercial quality—used in a wide variety of products—is the only grade for which an extra is not charged. Common sense dictates its use whenever and wherever possible.

Most steel companies will recommend the use of commercial quality for bending and moderate forming. Commercial quality in the hot rolled grades will normally have a slight oxide coating on the surface. This coating, however, is not objectionable in mild forming operations. The cold rolled grade is normally free of an oxide coating.

Both hot rolled and cold rolled grades are capable of withstanding standard bending tests. Any additional mechanical tests requirements are not covered in the commercial quality classification. For this reason commercial quality is not recommended where either greater ductility or other special test requirements are essential.

Rimming type steels are used for drawing quality sheet and strip. The steel producer is responsible for the quality of steel, control of processing, and for the material's performance within established breakage limits. Drawing quality is your best buy for applications requiring greater ductility than that provided by commercial quality steels.

Drawing quality-special killed steel is often recommended for more difficult drawing applications. Only the cold rolled grade provides for special processing to eliminate stretcher strains or significant changes in mechanical properties over a period of time. The hot rolled grade is generally less subject to the effects of aging.

Cold rolled v. hot rolled

The problem of when to use cold rolled steel and when to use hot rolled steel can frequently be decided on the basis of a few simple rules. Generally speaking, inside parts that do not involve a difficult draw can be made of hot rolled steel. Where the drawing problem becomes increasingly difficult, cold rolled steel is specified because of its superior forming properties.

Most sheet and strip will be subject to one or more of three processing operations: cold drawing, pressing and stamping. The type of deformation resulting from these operations has much to do with the way the metal behaves as the mechanical characteristics of the metal itself. Many stamping operations result in only slight deformation. Thus, the steel requires relatively little cold plasticity in order to do a satisfactory job.

For more complicated parts you will want a high degree of cold plasticity. Not only are shapes complex, but there is more involved in the forming operations than mere bending. The material is highly stressed in some locations and only lightly stressed in others.

This combination of extremes presents a difficult forming problem. It requires materials capable of complex-multidirectional deformation.

Buying a top drawing grade of steel for this type of complex forming is getting the most for your steel dollar. Any compromise in quality would only result in a high breakage rate at the dies.

Drawing requirements can sometimes become so complex as to defy definition in standard specification. In cases of this sort, both steel users and suppliers must be willing to settle for a reasonable compromise.

It may be necessary for the buyer to provide an additional roller leveling operation, a skin pass, or an in-process anneal in order to overcome some of the problems inherent in critical operations.

If a forming requirement becomes so critical that an excessive number of in-process operations are needed, an alteration of design to

provide less critical forming may be the only economical answer to the problem.

Other quality extras can be had for both the hot rolled and cold rolled grades. For example, a special soundness requirement or special physical quality requirements can be provided where necessary.

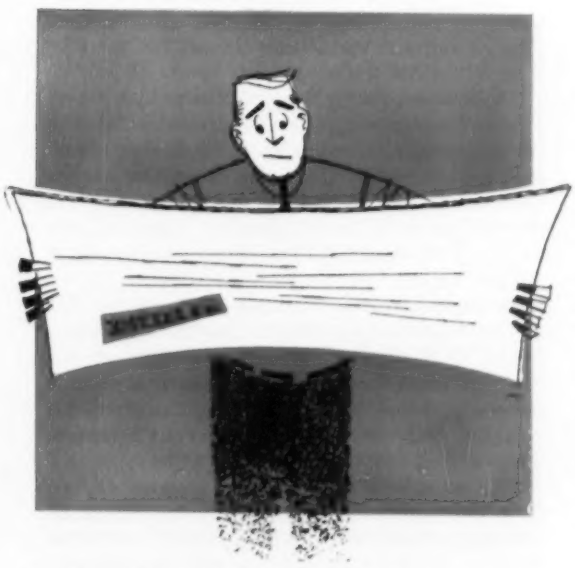
Weighing surface finish extras

Surface finish extras should always be critically examined. In most cases, drawing quality sheets are produced with a matte surface finish, impressed during rolling. This type finish is generally desirable in drawing.

When needed, special surface requirements can be met by surface grinding either the hot or cold rolled grades. The quality provided for this special surface extra is intended to produce a high surface finish for such applications as automotive bumpers, electric toasters and other items requiring a high surface finish for electroplating or similar applications.

In some instances, the use of a special grade can be justified because of its ability to cut costs in subsequent operations. An example of the wise application of a more expensive sheet grade is to be found in the use of enamel iron and Ti-namel drawing quality.

The Ti-namel grade, especially, has proven itself to be a bargain where an enameling operation is required. Ti-namel requires only one coat of enamel to produce an acceptable appliance finish. By eliminating the costs of the extra enameling operation, Ti-namel, in many instances, has been well worth the 3¢ per lb extra charged for this grade. Remember that a study of surface finish may improve your process as well as your product.



"...the problem of drawing quality warrants careful review..."

Plain carbon v. alloy

Both sheet and strip can be had in plain carbon and low alloy grades. The plain carbon grade is the cheapest and most widely used. The carbon content of this grade does not usually exceed 0.15 pct. Any alteration of the chemical requirements beyond the standard ranges is apt to be expensive. In the majority of cases, alterations of the standard chemical ranges are not justifiable.

The low alloy grades are intended primarily for applications requiring higher strength. In some instances, these grades are also specified for applications at elevated temperatures up to about 900°F.

A decision as to whether a plain carbon or low alloy grade is required should be relatively clear cut. Normally, it is based directly upon the stress calculations of the designer.

However, there have been instances where a heavier gage of plain carbon steel could be substituted for low alloy material. If weight considerations are not important, such a substitution may sometimes be worthwhile.

Such decisions must always be based on the specific engineering requirements of the part in service.

Bars and Shapes

Unlike sheet, bar and structural shapes are bought primarily on the basis of strength considerations. Actual requirements are based on stress analyses—either plain or fancy. Once the strength requirements have been determined, the next important step is making sure you get the most for your steel dollars.

This decision, in turn, must be based on four top considerations: 1) Whether to choose a plain carbon or an alloy grade, 2) Ease and applicability of heat treatment, 3) Machinability (or forgeability, formability—depending upon your application), and 4) Dimensional requirements.

Bar stock and structural shapes can be bought on a quality basis at lower cost when extras are cut to the bone. Certain quality features are mandatory, depending upon in-plant processing and end product use. These quality requirements must be carefully reviewed if maximum savings are to be realized.

Plain carbon steels have one distinct advantage. They usually cost less, pound for pound. Use of the low carbon grades is just about universal where strength considerations are not critical.

Some of these grades can be found in your home appliances, automobile, gadgetry, office machines, and thousands of other applications. These steels are generally easy to gang machine and form. They lend themselves to a broad range of mass production shop tech-

niques. But they can not be hardened by heat treatment, and their strength limits are definitely on the low side.

The higher carbon grades of plain carbon steel can be heat treated. They provide improved strength, but they are shallow hardening. When surface hardened, they have reasonably good abrasion resistance.

These grades are widely used in simple tools such as screw drivers, wrenches, and drills. They can also be found in farm machinery and other mechanical applications requiring higher strength than can be had with low carbon grades.

If field experience indicates that your product can make use of these carbon grades, they may save you money which might otherwise be wasted on extra alloy.

When to use low alloy

But suppose your design indicates that you must use an alloy grade. The job then boils down to choosing the most serviceable alloy within the cost limits prescribed by the selling price of the finished product.

Alloy steels almost invariably cost more. But they provide a number of economic advantages in addition to making your product stronger and more durable.

They have frequently brought about a reduction in heat treating costs. The reduction can not usually be defined in terms of less furnace equipment, handling, or the like. Normally it results in a marked reduction in rejects due to cracking and distortion. This automatically boosts production and income potential.

"... don't approach your heat treating problems casually ..."

Because alloy grades can be heat treated to various hardnesses and microstructures, they permit you to choose the conditions best suited to your machining operations. The greater the variety of machining operations, the more profitable this asset becomes.

When alloy grades are similarly heat treated, they give you a degree of uniformity of properties that will lessen shop problems generally. The same rake can be applied to all cutting tools. Speeds and feeds can be standardized. This all adds up to savings, whether direct or indirect. It also provides a product which can be depended upon for uniform operation in the field.

For example, a manufacturer of power hoists switched to an alloy grade simply because of a multiple drilling operation. Strength considerations in this case were relatively unimportant. A plain carbon steel had been performing satisfactorily in the field.

But because the accuracy of the holes drilled could be better controlled in uniformly heat treated alloy, the use of alloy was justified by a much lower rejection rate. While pound-for-pound the material was more costly, finished part costs were appreciably reduced.

In this particular case, there exists still another advantage which may be tapped in the future. Should design requirements ever make the use of alloy mandatory on a strength basis, no substitution need be made for the material in use. Since the demands made on many products tend to increase in time, the use of alloy represents an anticipated, as well as a real, saving.

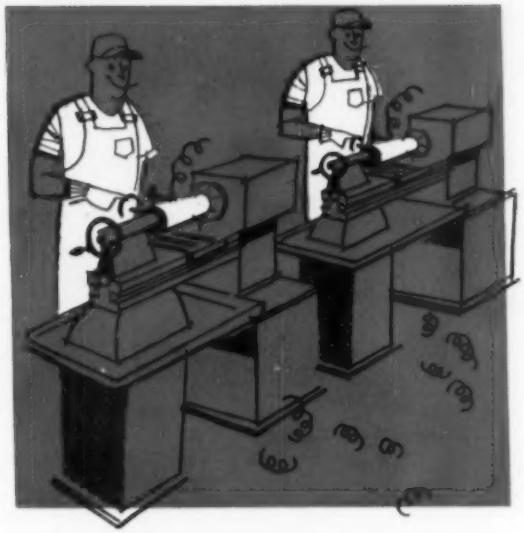
Curbing chemical extras

When choosing any steel, always try to live with the standard chemical analysis. This applies to both plain carbon and alloy grades. The standard grades are those listed under the AISI-SAE designations.

Remember that chemical extras are expensive. These are the surcharges billed you by your supplier for requesting restricted chemical requirements. Even in the plain carbon grades, the costs of a fancier chemistry runs high. Restricted ladle chemical ranges on carbon and manganese alone will cost you about $8 per ton.

When you move into the alloy grades, the possibilities for chemical extras increase many times. And so, too, do the possibilities of piling up extra costs. So for sound economic reasons, keep your chemical requirements simple—preferably those quoted as standard ranges.

The standard chemistries for both carbon and alloy steels are based on a wealth of steelmaking experience, product tests, and sound metallurgical judgment. It is economically foolish to sell this kind of experience short, especially if it boosts your costs.



"... uniformity of properties will lessen shop problems generally..."

The steel makers—who may stand to profit from such extras—usually advise against them in no uncertain terms. Even their metallurgists are perplexed by certain customers' hair-splitting requirements, since many of them are without metallurgical justification.

Once you've decided to live with the standard AISI-SAE analyses, don't let the number of available alloys complicate your cost saving picture. There are, in fact, some 23 distinct series of steels classified by AISI-SAE. But the ground rules for choosing the alloy that will give you the most for your steel dollar haven't changed. As a general rule, concentrate on those analyses which give you the best mechanical properties and processing characteristics for the least alloy.

The 23 series were not developed in an attempt to contribute to confusion. They serve a valid and useful purpose. Somewhere, somehow, each of these alloy types is being put to work—and with proper justification.

But a considerable number of these alloys are relatively "rare birds," both on a tonnage and application basis. Their use is restricted to specialized segments of American industry.

If your product can be classed in a more general category, choice of an alloy can be quickly reduced to a few of the more widely used analyses. The ability to capitalize on one of the more popular grades not only saves you money in many instances, but also tends to vastly improve your procurement position.

The supply of an alloy must, to some extent, be predicated on demand. Thus the more popular analyses are almost always easier to get.

Don't allow the popularity of an alloy to arouse your suspicions as to its applicability to your product. Usually, its broad applicability tends to confirm its general usefulness—in your case and many, many others.

One of the leading manufacturers in the U. S. whose products range from small appliances to giant industrial equipment uses *one* alloy grade almost exclusively. The grade is 4140. With an engineering staff counted in the hundreds, no one has yet come up with justification for choosing a single substitute, much less a garden variety of special grades.

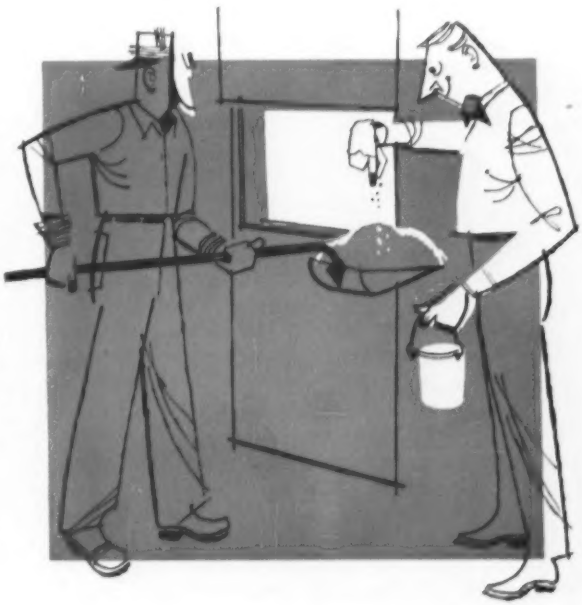
Which alloy to choose

From an engineering standpoint, your choice of alloy should certainly reflect the types of stress to be met in service. Under most service conditions, stresses encountered will involve varying degrees of tensile, shear, torsion, impact and fatigue.

Two simple rules will help clarify your stress problem. Remember that where loading is primarily in tensile or shear, through hardening steels are your best bet. Bolts and springs are classic examples of components subjected to these types of stress.

Where fatigue and impact are the primary problem, it is usually advisable to steer clear of through hardening. Laboratory and service tests have shown, for example, that a shallow hardening pattern in highly stressed axles outperforms a through-hardened axle.

For broad applicability, three alloy series are among the more widely used in the U. S. They are the 4100, the 4300, and 8600 series. The 4100 series contain chromium and molybdenum, whereas the last two series also contain nickel. These three grades provide unusual strength despite their relatively low alloy content.



"... remember chemical extras are expensive..."

Other reasons for their popularity include good machinability and consistent response to heat treatment. But it is mostly because they give you a lot more strength for very little alloy that they are so often chosen as a wise buy.

Don't overlook the boron-containing grades. These were specially designed to conserve alloy during periods of national emergency. Their popularity is likely to increase. Their service in the shop and in the field is no longer a mystery. Check the available data. There may be a place for these alloy-savers in your cost reduction program.

Working Tolerances

A realistic examination of your size, length, and thickness tolerance requirements may cut costs and lead you to getting the most for your steel dollar. Such a review should be applied to all of the steel you buy—hot rolled or cold rolled, bar, plate, sheet or what have you. If your processes can tolerate relatively minor deviations in dimensions (as is frequently true), doing away with some of the fancier tolerance requirements may prove to be a major source of saving.

Moving along with the tide is always a lot easier than bucking it. The steel mills have long since adopted certain manufacturing practices, some of which are dictated by the limitations of their own equipment. Try to adapt some of your own practices to suit. Remember that the likelihood of revamping the entire steel industry over night is mighty slim. So don't expect the impossible.

In the manufacture of sheet and strip, hot rolling normally produces a "mill edge." This is an as-rolled edge and does not conform to any definite contour. If your operations normally include a certain amount of edge trimming in process, buying a mill edge may save money. Also the elimination of any extra operation at the mill tends to improve finished steel capacity during periods when steel products are in tight demand.

It is standard mill practice to produce sheet and strip to decimal thickness. This applies to both coils and cut lengths. Make it a practice to order by decimal rather than by gage. It simplifies matters and leads to less confusion all around.

Eliminate fancy thickness tolerances wherever possible. Not only do they pile up your extras, but they put an appreciable dent in the mill's productive capacity. Most steel mills are not custom job shops. They comprise an enormous mass production industry. Requirements which run contrary to mass production practice are bound to interfere with normal production.

"... eliminate fancy thickness tolerances wherever possible ..."

On the subject of rigid thickness requirements, THE IRON AGE went to a major steel producer for a direct answer to a question that has probably occurred to many steel buyers. We wanted to know whether mill thickness tolerances were based on the capabilities of new or obsolete equipment. In other words, are steel users being forced to pay extra for tolerance simply because equipment can not hold to reasonably close tolerances?

The answer, we were told, is "no—definitely." Even the latest equipment is geared to mass production tolerances. When tolerances have to be held very close, the rejection rate at the mill begins to mount. Perhaps only 50 pct of the sheet rolled can be shipped.

This becomes an extremely expensive and time consuming proposition. It means producing twice the tonnage in ingot to fill a single order. Since each ingot is cropped as a matter of practice, the loss in melt tonnage runs even higher.

As a steel buyer, you can stretch your steel dollar a lot farther by gearing your processes to mass production tolerances. Remember that unrealistic tolerances boost nothing but the scrap rate.

Along this same line, go easy on your resquaring and reshearing requirements. Camber and out-of-square tolerances should also be broadened whenever feasible to keep these extras to a minimum.

Make the most of mill lengths when ordering your bar stock. This will help minimize cutting extras. A review of bundling and lift weight extras is also in order. Bear in mind that when your lift weights are under 3 tons, you are obliged to pay an extra. If you can avoid intermediate bundling, still another extra can be saved.

Heat Treating for P A's

Heat treatment controls the properties of your steel. By making sure that these properties are best suited to the machining of your product, you are saving valuable shop time and holding your tool costs to a minimum.

By providing your finished product with the heat treated properties best suited for its job, you are guaranteeing a good, competitive product. It is the quality of this product that ultimately keeps you in—or puts you out of—business.

So don't approach your heat treating quality problems casually. They are not fringe problems. They are basic — metallurgically and economically. Good heat treating practice adds much to your steel dollar. It gives your choice of steels their *optimum* properties. Anything less is cheating your product of its rightful potential, making it less competitive.

To study your heat treating requirements, first set your sights on the steels you use. Don't start in a tangle of decisions about which equipment to buy and for how much.

A study of your steels will supply most of the basic answers concerning your equipment needs, if any. Some of your steels will not require—or, perhaps, not even respond to—heat treatment. Others, requiring heat treatment, may be purchased more profitably in the heat-treated condition.

Make sure that simplicity of heat treatment is taken into account when you choose heat treatable steels. Even if you don't do your own heat treating, a relatively simple heat treatment is going to cost you less when the job is farmed out.

Because of strength considerations, most—if not all—of your heat treatable steels will find their place in the finished product in the "quenched and tempered" condition. But some preliminary heat treatment is often required to make the job of machining easier and more economical.

Why heat treating pays

An understanding of some of the principles of heat treatment will help you make decisions that are not only sound but also dollar-saving. Fundamentally, heat treatment either softens or hardens heat treatable steels. Obviously you don't want to set up to machine Rockwell C-60. In practice, even the machining of Rc 40 is a tough job. So you have to get your hardness down to some reasonable level where machining becomes economical and able to provide your required surface finish.

Your metallurgist (or your supplier's metallurgist) will tell you that good machining depends as much on a suitable metal structure as it does on hardness. Both can be obtained by proper heat treatment. Make the most of this fortunate combination, or be prepared to wrestle with costly machining problems.

Unless finished part hardness requirements are in a machinable range, final hardening and tempering will have to follow the completion of all machining operations. Don't skimp on your budget for heat treating at this stage. Rejections due to improper heat treatment, decarburization, distortion, quench cracking may not be salvagable. Such scrap is the most expensive. It represents a loss not only of metal, but most important, the matchining time and other processing you have put into the part.

After you have collected all of the necessary heat treat information pertaining to your steels, the next step is to decide whether or not to do your own heat treating. Keeping heat treating in your own shop has many advantages. Not only are your heat treating facilities available at all times, but you can readily set up your own processing controls. If the investment in equipment and personnel is justifiable, doing your own heat treating is very worthwhile.

If the initial investment is too steep or the operating costs excessive, you may choose an outside heat treater. Choose one who knows his job and has the proper facilities for your requirements. Some companies prefer to have their own metallurgist check the heat treater's facilities before placing an initial order.

For parts requiring surface or "case" hardening only, investigate the possibility of induction heating and flame hardening. Because these processes are speedy, per unit costs for heat treating are frequently low and equipment requirements are minimized.

"... make sure that simplicity of heat treatment is taken into account..."

HOW TO GET MORE FOR YOUR STEEL DOLLAR

SECTION 2

Processing

Materials Inspection

Quality Control

Effective Foremanship

Furnace Controls and Equipment

Plating Problems

Controlled Carburizing

Nitriding

Flame and Induction Hardening

Normalizing

Annealing Cycles

Materials Inspection

◆ TO GET MORE FOR THE STEEL DOLLAR, purchasing agents throughout the nation will be calling upon plant quality control and processing personnel, as well as metallurgical engineering, for helpful suggestions. Purchasing will be carrying the ball on prices, the elimination of steel extras—wise buying, generally. But they will expect—and deserve—a lot of assistance from the production quality and engineering teams.

In plants which have regarded their purchasing men as "ivory tower boys," a change of attitude will be in order. Certainly no purchasing man normally presumes to know shop problems first-hand. He must rely on the wealth of practical and scientific information available primarily in the shop, the inspection department and the metallurgical laboratory. All four groups must be integrated as one effective cost reduction team.

In order to eliminate steel extras, your purchasing men will suggest a number of possibilities, some of which may require slight alterations of current shop and inspection practices, minor departures from the usual way of doing the job.

Think before you buck. Don't follow the reactionary pattern of blindly resisting change. Your contribution to getting more for the company's steel dollar—in the inspection crib, the shop, and the metallurgical laboratory—can be challenging creative. Capitalize on this opportunity to help your company and enhance your own position.

A good materials inspection system is your careful watchdog of quality. By systematically checking the steels you buy, it makes sure that you are getting your money's worth. By steering unacceptable material away from your production floor and guaranteeing the quality of your product, it helps you to get more for your steel dollar.

Such an inspection system isn't likely to win popularity contests with the rank and file. Perhaps this stems from the fact that careful inspection is management's front-line representative. Quality control may sometimes meet with considerable resistance. To this extent, it involves human relations. Make sure your inspection personnel have the qualities needed for this highly sensitive job.

Most of all, your inspection decisions should be based on merit and established specifications. External pressures and arbitrary methods very quickly undermine quality. Avoid these pitfalls by establishing the ground rules *in advance* of quality decisions. Then back your inspectors with enough authority to act independently in the interests of quality control.

Effective materials inspection isn't cheap. Therefore it should be applied sparingly but

without jeopardizing its fundamental value. "Screening" or 100 pct inspection should be held to a minimum. Not only is it costly, but it is seldom foolproof. The monotony of such testing creates operator fatigue and inattention.

Lot-by-lot inspection is probably your best bet. In order to work effectively, it will need a carefully devised sampling plan matched to your special requirements. Any old plan—arbitrarily arrived at—won't do. Haphazard plans usually lead to extremes: too little or too much. The most effective sampling plans are usually derived from statistical surveys.

The number of points to be checked on your incoming steel lots will depend principally upon your processing requirements. Since this will vary from plant to plant and from product to product, it is almost impossible to generalize.

A few helpful hints are worth reviewing. A Jominy end-quench test of hardenability is very worthwhile for all bar which you intend to heat treat. If your bar is to be carburized or nitrided, a check on grain size might also be in order.

Testing chemical composition is seldom necessary except for the most critical applications. Most steel users go along with the accuracy of the certified analysis submitted by the steel supplier.

One very important point. Try to keep your bar segregated by lot number even where chemical composition and size may be identical. The merits of this system justify the slight extra cost entailed. For if a particular lot of steel should cause trouble in the shop, it can be quickly pulled without odd bars returning to the floor.

In checking your sheet and strip, you might want to take a quick reading on dimensions and surface finish. Segregation of damaged or badly corroded material will save you loss of time in the shop.

If the sheet or strip is to be subjected to moderate bending or forming, no further checks are usually required. For severe forming, cup testing may be of some value. The final test, unfortunately, will still take place in your dies.

"...100 pct inspection should be minimized..."

Heat Treat Control

Heat treat foremen and metallurgists can make a major contribution to getting more for the steel dollar by aiming at a reduction in scrap rate. They are in the best position to investigate causes and cures.

A percentage of scrap results from individual negligence. A combination of personnel training and closer supervision can usually solve this shortcoming. This does not mean riding your manpower mercilessly—even if that were possible. It does mean making your instructions clear-cut, being certain your men understand their functions and responsibilities.

Too frequently the operator on the floor goes about his job in an aura of confusion. When questioned about an error which has resulted in needless scrap, the standard answer often is: "Well, I didn't know . . . Nobody told me to . . . I thought Joe was handling that operation . . ."

An effective foreman knows how to distinguish the phoney excuses from the understandable gripes. So make sure that your instructions to subordinates are clear enough to avoid mishaps. eliminate excuses.

Poor temperature uniformity in your furnace operations is another major cause of scrap. Sometimes production parts can be "reworked," but only at an increase in cost. If temperature uniformity is one of your shop problems, get after it in a positive way.

Learn the most effective ways for checking temperature uniformity. Get some really good pyrometric equipment and controls, and put them to work. If your management complains about the cost of such equipment, don't just give up and return to the old scrap rate. Keep records. Justify your case in dollars and cents. Chances are that new equipment will be in your hands in short order.

Perhaps you are battling obsolete furnace equipment. This isn't uncommon, and a lot of shop foremen are up against the same problem. Make sure you are headed in the direction of a positive cure. Again, it will be your job to convince management that a replacement of equipment is justified.

Present these justifications with tact and strong statistical backing. Remember that the standard gripes are no substitute for a sound argument.

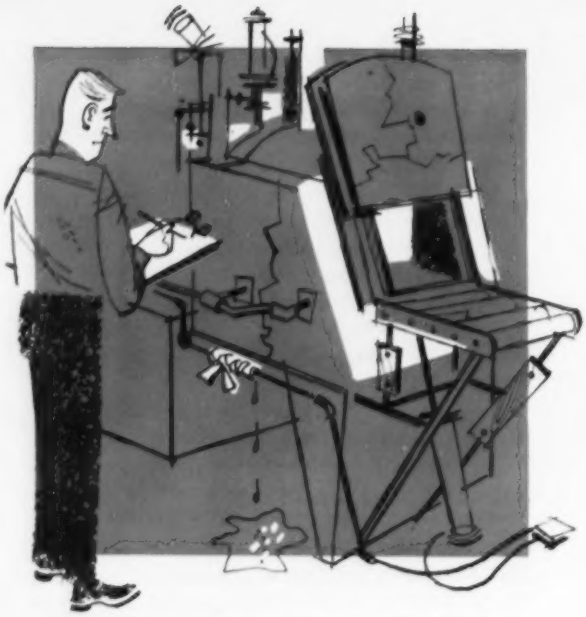
Try to come up with a plan that permits gradual replacement. In this way, shut down will be minimized. Don't propose a grandiose plan that, if adopted, would bring your plant to a standstill. Management obviously won't buy it.

Most of all, don't allow a sound proposal for new equipment to deteriorate into a discussion of personalities. Ultimately, your management is just as interested in knowing the facts as you are in presenting them. Don't allow impatience or personal antagonisms to detract from the impact of a sound case, impartially presented.

Protective atmosphere and its control is another common shop headache. If your basic generating equipment is in reasonably good working order, systematic gas analyses may be the answer to your problem. Provide for frequent gas checks—perhaps as many as six in a three-shift day—until you can put your finger on the source of the trouble.

In order to provide these checks, you will need sufficient personnel on all shifts capable of running gas analyses. Pick and train them from your regular crew. After all, routine gas analysis does not require a specialist. Your more alert workers will probably appreciate the opportunity of learning more about what makes the job tick. The extra knowledge will enhance their value to the shop and better their chances for promotion.

If your systematic findings indicate a fault in the generating equipment or a lack of furnace tightness with which you are unable to cope with, you have the makings of a sound presentation to your management. But remember to check with your furnace and generator suppliers before seeking top-side support. First, find out definitely whether or not your problem can be solved by repair. Don't stick your neck out by proposing a replacement that can't be justified.



"... first, find out if your problems can be solved by repair ..."

"... a percentage of scrap results from individual negligence ..."

Plating control cuts scrap

Even with better than average furnace, generating, and control equipment, protective plating can sometimes be the principal source of trouble in heat treating operations. This would apply particularly to scrap loss due to decarburization.

Copper is the coating most widely used for protective purposes during heat treating. It is also widely used as a "stop off" in selective carburizing applications.

Maintaining proper copper bath temperatures, current densities, and correct solution chemistry is obviously essential. Freedom from contamination of solutions is also necessary. Such contamination is most likely to be recognized in the course of routine chemical checks. Current density problems are sometimes solved by a careful check of control instrumentation and a review of procedures for calculating current density required.

Bath temperature problems may indicate the need for *recording* temperature controllers—especially on two and three shift operations. Multi-shift operations frequently lack the degree of continuity necessary for continuous, accurate control. They also suffer from what may be termed the "crossed wire" transmission of information.

Recording controllers help to provide a complete record, thereby holding the adverse effects of shift changes to a minimum.

A major cause for inadequate copper plate pro-

tection is improper cleaning prior to plating. It results in the blistering or peeling of the protective copper plate during furnace operations or quenching.

The condition stems from poor adherence of the plate to the steel because of an interlayer of contaminants not completely removed during cleaning operations. This condition can increase your scrap rate to phenomenal proportions if decarburization or carbon drop-off is cause for rejection.

Approach this problem with caution. It can be highly complex. It may be necessary to add a certain amount of mechanical cleaning to your chemical cleaning line in order to completely solve the problem.

If you go to mechanical cleaning, try to hold your individual part handling to a minimum. Piece-by-piece handling is extremely costly in any mass production operation. So try to adopt a mechanical cleaning system that incorporates batch, mass production procedures.

Also, don't forget to set up a careful check on your hardening line designed to spot blistered or peeled copper plate when it occurs. This won't necessarily reduce your scrap rate, but it will eliminate duplicate inspection and help guarantee perfect heat treat quality.

Consistent carburizing results

Although any additional control in heat treating is usually a big help, case depth control in carburizing can frequently result in cost reduction. Control of carbon content in the case can have the same effect.

Such control can now be maintained automatically and with reasonable assurance of accuracy. Check into the new instrumentation now available for this purpose. You may be surprised to find how easily it fits into your operations.

When you make your control instrument survey, you will notice that two basic types of carbon potential controllers can be had. The major difference between them is to be found in the method used to achieve control. Their accuracy and ability to do a job has been pretty much assured on the basis of production experience.

One basic type controller operates on the electrical resistance principle. It uses an iron-nickel alloy wire control element for this purpose. The element is contained in a protective tube. Both are inserted directly into the work area of the carburizing furnace.

The circulating atmosphere is forced into the open end of the protecting tube. Thus the gases are constantly making contact with the wire resistance element. At carburizing temperatures, the element continuously absorbs or releases carbon, depending upon the atmosphere potential.

Changes in the carbon content of the wire affect its electrical resistance. These electrical changes are monitored to a control instrument which automatically adjusts to provide the desired carbon potential.

Another type of controller works on the basis of dew point measurement. It is well known that carbon potential can be increased or decreased by raising or lowering dew point. This principle is put to good use. By constantly checking dew point automatically, carbon control is achieved on a continuous basis.

But even if these controllers were infallible, good metallurgical control would still be essential. This can be achieved by means of systematic spot checking.

For example, in gas carburizing, a half dozen or more stack washers or bars should be suspended into the furnace from the furnace stack for control purposes. Similar specimens should also be used for pack carburizing applications. In this case, be sure that the specimens are located in a manner that will provide a check of representative conditions throughout the pack.

Simple washers should be pulled periodically for a check of case depth. To do this, simply extract a washer from the furnace stack or carburizing pack and after allowing it to cool to about 1500°F, quench in oil.

The washer should then be fractured and a measurement of case depth made from the fractured surface with the help of a Brinell glass. The measurement obtained from a fractured specimen will differ slightly from one made on a polished and nital-etched sample. But since the difference is negligible for all practical purposes, it won't affect the accuracy of your control.

You will find that a stack washer check of case depth can save a lot of valuable furnace time. It eliminates guess work—especially the chance of either over- or under-casing.

"... present new equipment requests with tact and statistical backing ..."

"... bath temperature problems may indicate the need for recording temperature controllers ..."

Over-casing is an expensive waste of furnace time even when it doesn't result in part rejection. Under-casing is almost always grounds for rejection. If undercased parts cannot be successfully recarburized, they must be scrapped. Stack washer checking will steer you away from both of these costly pitfalls.

Since controlled case depth is not the only requirement for carburizing quality, a thorough microscopical analysis of structures and hardness testing will help to round out your quality program. Make sure that tests have been completed for each load before that load is released from your heat treating area. Don't move parts on to the next machining operation only to find that they must be returned to heat treat for a rework cycle.

Unless such parts are individually marked, they will invariably get mixed in with other parts in the shop. Frequently it will be impossible to segregate good from bad—short of destructive testing.

A worthwhile microscopical evaluation should include the following points: 1) estimated case carbon content, 2) size and distribution of carbides, 3) general surface condition, 4) extent of carbon drop-off or decarburization at the surface, if any, and 5) estimated percentage of retained austenite. All of these points should be carefully checked on *tempered specimens only.*

Many of your carburized parts may be difficult or impossible to hardness check on the surfaces where hardness is most critical. This is particularly true of recessed holes and the loaded surfaces of gear teeth. For this reason, it is wise to include special hardness test specimens with each carburizing load.

Always make sure that some of these specimens are run through all subsequent heat treating operations with the parts they represent. These specimens can save you a lot of costly destructive testing. They can also provide you with a case hardness v. case depth curve which you can use as a guide in grinding and other stock removal operations.

Shop tips for nitriding

In nitriding, always observe the recommended rates of dissociation. Make sure your ammonia storage tanks are dry and that your entire system is free of water.

Cleanliness of parts is very important. So make sure that parts are free of grease and dirt before nitriding. Even slight contamination will frequently act as a stop-off.

Bear in mind that nitriding steels must be properly heat treated before nitriding. Improper heat treatment may result in "white nitride" build-up to a degree that will result in spalling. Make sure that your quenching temperature does not fall below 1700°F. A lower temperature may not produce a homogeneous structure.

Cooling rate from the hardening temperature is also important. For this reason, oil quenching is normally used to provide fast and uniform cooling. A recommended oil bath temperature range is 130° to 150°F. Beware of a drop in oil bath temperature, especially during cold weather. It can be a major cause of cracking.

After proper hardening, it is essential that tempering be carried out at a temperature higher than the nitriding temperature. A lower temperature will usually result in serious distortion during nitriding.

A gear manufacturer suffered a major scrap loss because he failed to deburr gear teeth prior to nitriding. Deburring after nitriding resulted in chipping that was serious enough to scrap the gears. So remember to complete all deburring operations in advance. This would also apply to the breaking of all sharp corners.

Grinding a nitrided case is a risky business. To avoid boosting your scrap rate, finish machine before nitriding. If a final clean-up is required for close dimensional requirements, either hone or lap.

Flame hardening is gaining wide attention because of its cost saving possibilities. It produces a hardened case by means of surface heating with either natural gas or acetylene. Any number of torches can be used, as required.

One of the advantages of the method is that it readily lends itself to automatic fixturing. Many flame hardening setups include means for locating, indexing, heating, and quenching. This technique can sometimes save you money by allowing you to do your heat treating directly in the processing line.

Induction heating offers most of the same advantages. Its efficiency for a given application

can be closely related to the operating frequency of the induction heating unit. For this reason, don't trust to luck on the choice of a unit. Always check your individual part applications carefully before coming to a decision on the best buy.

Encourage new ideas. Scientific heat treating is not a very old business. New ideas are always in the making. Where they apply to your operations, try them on a small scale.

Never make the fatal mistake of proposing a revised installation before acceptance testing actual parts. Remember that pilot plant testing has been adopted as standard procedure in many industries. It is your guarantee that experimental problems will not become production problems.

The economical operation of your regular heat treat processes always depends to a great extent on an ability to come up with the right technical answers. Usually, this responsibility is placed in the hands of the man specially trained for the job—your plant metallurgist. In the course of a single shift, he may be called upon to make a number of decisions which could result in getting you more for your steel dollar.

Normalizing and annealing

One such decision that frequently has to be made is whether or not to normalize. Many of the steels you buy have been subjected to hot forming. Hot forming covers a lot of territory. It includes such processes as forging, rolling, hot piercing, and hot upsetting.

Hot forming does a wonderful job of providing many of the steel shapes you require. But it frequently results in harming some of the internal properties and structures of the material. Hardness may be extremely nonuniform. This condition raises havoc in machining. Grain size may vary from very fine to very coarse. This affects not only machinability but response to heat treatment as well.

"... part cleanliness is very important ..."

Normalizing brings the steel back to a normal and uniform condition. The treatment itself is relatively simple. The nonuniform material is heated to a temperature not less than 100°F above the temperature at which transformation of ferrite to austenite is completed. After a selected time at heat, it is cooled in air to room temperature.

Sometimes grain coarsening is exceptionally severe. A double normalizing operation is usually recommended in such cases. This treatment consists of first heating to about 1800°F, followed by a second treatment in the 1650 to 1700°F range.

Because the normalized steel now has a uniform grain structure, its hardening characteristics will be dependably uniform. Distortion in subsequent heat treatments will be considerably less severe. And, most of all, your final product will have the consistent mechanical properties it requires.

Annealing is another cost saving heat treat process when it is correctly applied. There are four general types of annealing cycles. To some extent, they may overlap. But the choice of the right annealing cycle for a particular application is not likely to be hit upon by guess work. It requires a thorough knowledge of the service requirements of the part plus the use of sound metallurgical judgment.

Cycle annealing is designed to give you a desired microstructure, a particular hardness, or both. It can be of great value in helping to solve many of your machinability problems. It consists of cyclic heating and controlled cooling.

Sub-critical annealing is comparatively simple as a process, but it can provide an answer to many tough shop problems. It is annealing at a temperature below that at which austenite begins to form during heating. Stress relieving and tempering to a desired hardness are its two prime functions. Where dimensional requirements are tight, this type of stress relieving after critical welding or forming can save many a part from the scrap heap.

Over-and-under critical annealing is often resorted to when either cycle or sub-critical annealing fail to produce the desired results in a reasonable amount of furnace time. It isn't widely used, but it definitely has its place in a versatile heat treating setup.

Isothermal annealing takes its direction from the information presented in the isothermal transformation diagram of a particular steel. The subject, again, is to produce the desired microstructure, hardness level, or both.

This variety of cycles offers you a broad choice of annealing procedures. Each can be aimed at a particular shop problem. Each can be of considerable assistance in making the best use of your steel in process.

"... choice of the right annealing cycle is not hit upon by guesswork ..."

Hardening for quality

When hardenable steels are used, the finished product will usually terminate its heat treatment in the hardened and tempered condition. For this reason, the hardening process becomes an important part of shop operations. Every aspect of the process should be reviewed from the standpoint of end product quality and operational costs.

The heating phase of the hardening process is the critical prelude to the cooling phase. If the heating phase isn't right, the cooling phase can't do the job intended. Both phases are interdependent, so that proper heating and quenching can be viewed as a single problem.

Heating to a temperature below the lower critical will produce little or no change in the original steel. Heating to slightly above the lower critical will produce a semi-hardened steel. Free ferrite will not have been affected and optimum properties will not have been obtained. Heating to a point between the lower and upper critical produces only slightly better results.

To get complete diffusion and total transformation, practically speaking, you must go slightly above the upper critical. This will produce the smallest austenite grain size possible. Proper quenching from this temperature will give you a satisfactorily hardened steel.

If your furnace equipment and control instrumentation are inadequate for the job, hardening can become a major headache. Temperature uniformity is an absolute "must" if your furnace equipment is to produce consistent results. Good temperature control is also essential if underheating or overheating is to be avoided.

Time at heat is another important factor. This doesn't mean total time in the furnace. It refers to the actual time the parts are at the desired temperature. Time at heat must always be sufficient to provide proper diffusion and homogenization.

Don't make the mistake of heating to temperature too rapidly by shooting your furnace up as far as it will go. Not only is this practice likely to shorten the life of furnace parts, it also contributes to distortion of parts and the chance of overshooting the desired temperature. Overheating results in grain enlargement and adversely affects mechanical properties.

Rate of cooling is as important as heating rate and time at bat. Rapid cooling tends to produce a primarily martensitic structure which, when tempered, provides optimum mechanical properties. Remember that rapid cooling and a too drastic quench are not synonomous. The latter could result in serious quench cracking.

When quenching in oil, it is always advisable to control your oil bath temperature. A cold bath may result in too drastic quenching. For this reason, oil quenching baths are frequently maintained at temperatures between 130°-150°F. Don't depend on hot parts to heat the bath. They will in time, of course. But you may have to scrap the parts used for this purpose.

If your oil system tends to overheat, some type of cooling system or heat exchanger is advisable. Quenching in oil that is too hot tends to reduce the effectiveness of the quench. It also constitutes a potential fire hazard, since the oil temperature is too close to the flash point for comfort.

Most heat treaters do not allow parts to cool to oil bath temperature. They remove the parts from the oil while they are still "smoking." This practice may tend to complicate operations, but it provides another safety factor to avoid quench cracking.

ACKNOWLEDGMENT

The editors want to thank the purchasing and production people in the many metalworking plants who have contributed ideas and suggestions to this feature. In addition, they particularly appreciate the assistance given them by E. H. Stillwell, consultant, Detroit and H. C. Smith, Director of Product Engineering, Claymont Div., Colorado Fuel and Iron Co., in preparing this material.

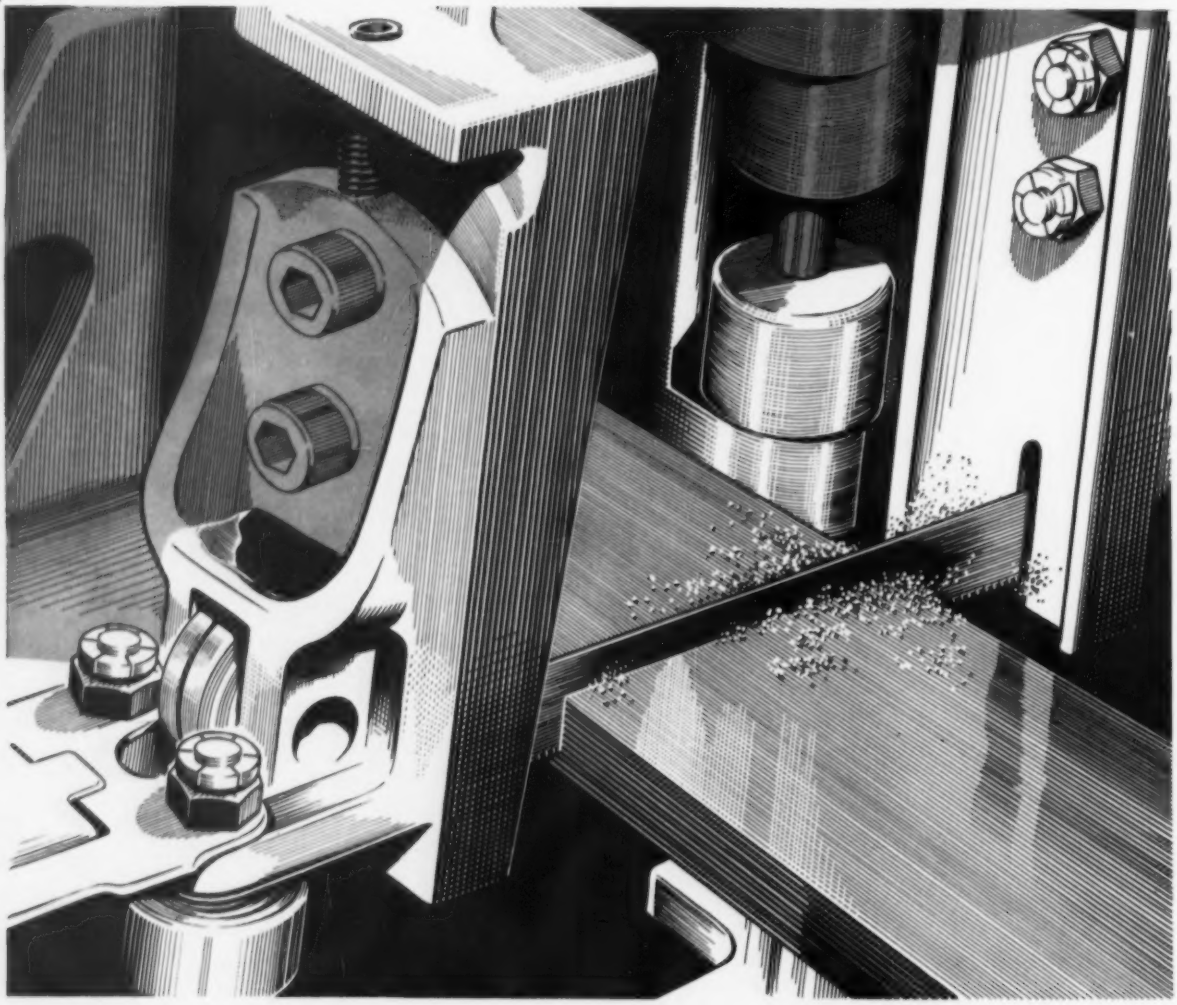
WANT EXTRA COPIES?

A limited number of copies of "How To Get More For Your Steel Dollar" will be available upon request to Readers' Service Dept., The Iron Age, Chestnut and 56 Streets, Philadelphia 39, Pa.

40 YEARS
of quality metals . . .

1955 marks 40 years of quality alloys by Titan metal specialists. Brass and bronze free-cutting rods, extruded brass shapes, bronze welding rods, brass wire, aluminum and brass hand screw-machine parts, brass pressure die castings, brass, bronze and aluminum forgings are produced to meet high standards and rigid requirements. Titan Metal Manufacturing Co., Bellefonte, Pa. Offices and agencies in principal cities.

FLEXLOC AT WORK



Power Hack Saw Builder Fastens blade guides with FLEXLOC self-locking nuts. Eight of these one-piece, all-metal locknuts are used in this assembly. And they won't work loose, regardless of vibration.

You can get the same dependable service. FLEXLOCs come in a wide range of sizes, types and materials. They are stocked by leading industrial distributors everywhere. Ask your local man for Bulletin 866. Or write STANDARD PRESSED STEEL CO., Jenkintown 17, Pa.

• • •

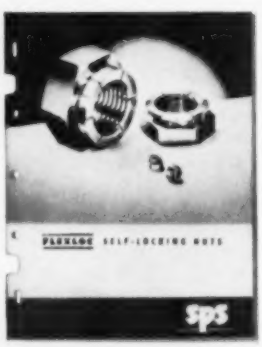
Use FLEXLOCs anywhere:

ON ROUGH BOLTS. FLEXLOCs smooth out bolt threads without damaging their own threads.

IN TEMPERATURES TO 550° F. in plated nuts and even higher in unplated ones. High temperatures do not affect FLEXLOCs. Nuts with non-metallic inserts fail under such conditions.

AS LOCK OR STOP NUTS. After at least 1½ threads of a standard bolt are past the top of the nut, the FLEXLOC stays put.

REGARDLESS OF MOISTURE, OIL, DIRT AND GRIT. Even conditions like these do not affect the locking ability of FLEXLOCs.



FLEXLOC®
LOCKNUT DIVISION
sps
JENKINTOWN PENNSYLVANIA

EASTERN TOOL AND STAMPING CO.

Typical example of 1-piece stamping from ⅛" thick by 7¾" diameter brass blank.

Here is a one-piece stamping that makes up into a hand stapler part.

STAMPING SPECIALISTS IN DEEP DRAWING WORK - ALL METALS - ALL INDUSTRIES

Typical intricate one-piece stamp.

Notice the reduction in this 4⅛" long by ½" O.D. tube with 1⅛" flange.

Difficult switch part for automotive industry.

Bulb base for photo flash lap and seam produced by high-speed process.

Intricate vibration mount parts for industry.

Spring tempered phosphor bronze switch contact — note flat fold-back feature.

ETS EASTERN TOOL AND STAMPING CO., Inc.
PRESSED METAL ENGINEERS
DIES AND STAMPING
SAUGUS MASSACHUSETTS

Atoms: Better Cell Shielding

Ferrophosphorus proves best aggregate for concrete used as protective shielding around hot cells . . . Shows no segregation in pouring or setting . . . Has good workability.

Use of ferrophosphorus as an aggregate for concrete used in protective shielding of atomic hot cell installations has simplified the construction of nuclear hot cells, according to Victor Chemical Works.

Atomic hot cell installations are shielding chambers, about room-size, in which radio-active materials are worked or handled in machining and other operations. Handling is accomplished by remote control through systems of mechanical arms and hands which extend through sealed entrances into the hot cell and function through levers and manipulators.

The necessity for close supervision of work within a hot cell, both visually and mechanically, makes the thickness of the protective walls which shield the radioactive materials of extreme importance. The thinner the wall, the easier the operation.

Many different dense materials, the best absorbers, were tested.

Ferrophosphorus, however, produced a density of 290 to 300 lb per cubic foot and showed excellent workability and no segregation in working, pouring, or setting. Being chemically inert, the resulting concrete protective shields are insoluble in acids and will not rust, thus providing dependable and long lived protection for operating personnel.

THIS IS LOW COST WELDING!
When a touch on a button moves weldments like these into the correct, most convenient position for a downhand pass, you get more arc time, more welding at lower cost. C-F power operated Positioners rotate the work in a full circle at any point in a range of 135° from the horizontal—giving welders a choice of an infinite number of downhand welding positions instantly.
Every requirement for faster, better positioned welding—constant or variable speed table rotation, full 135° tilt, self-locking gearing which holds the table in any position, oversize built-in main tilt and rotating bearings, choice of two base styles, and many other features—are built into C-F Positioners.
C-F Positioners are available in Hand or Power operated models, and are made in capacities up to 30,000 lbs. and larger.
Write for the new C-F Positioner Catalog
CULLEN-FRIESTEDT CO.
1303 S. Kilbourn Avenue Chicago 23, Illinois
C-F positioned welds mean better, more economical welds
CULLEN-FRIESTEDT CO., CHICAGO 23, ILL.

Fixtures:

Plastic steel reduces part costs.

A material consisting of 80 pct steel and 20 pct plastic, which is being used by General Electric Co., for making small fixtures, repairing dies, etc., has reduced the cost of one fixture used in the manufacture of jet engine parts from $200 to about $20.

The material, which handles like modeling clay, is produced by Chemical Development Corp., Danvers, Mass. It hardens two hours after the addition of a special hardening agent to become a rigid, tough, steel-like mass, without heat or pressure required. Once hard, the material can be sawed, threaded, drilled or ground on regular metalworking equipment.

Other applications for which the material is used include making tools, drill jigs, and fixtures for holding parts during machining, buffing and assembly operations, chuck jaws, nests and other items.

Handles like putty . . .

(Advertisement)

You can simplify purchasing . . . improve design . . . speed production

with improved C-D-F DILECTO® laminates

Only C-D-F, the Continental-Diamond Fibre Company, makes Dilecto laminated plastic, just as only Cadillac makes a Cadillac. Dilecto is 50 different materials with more combinations and variations in desired properties than we can tell you here.

But Dilecto has three important qualities that you should think about if you buy, design, or machine laminated plastics.

DILECTO HAS HIGH MECHANICAL STRENGTH

Mechanical strength is frequently an important determining factor in the selection of an insulating material. Insulating parts used in large electrical power equipment are frequently bulky. The high mechanical strength of Dilecto helps reduce size-dimensions of insulating parts without danger of failure. Instruments, meters and small motors frequently require very small insulating parts which must withstand comparatively large mechanical stresses. Insulation for use in high frequency circuits should have a minimum bulk factor for minimum dielectric losses. Dilecto fulfills these requirements with a combination of high mechanical strength and low loss factor, characteristic of the better C-D-F electrical grades.

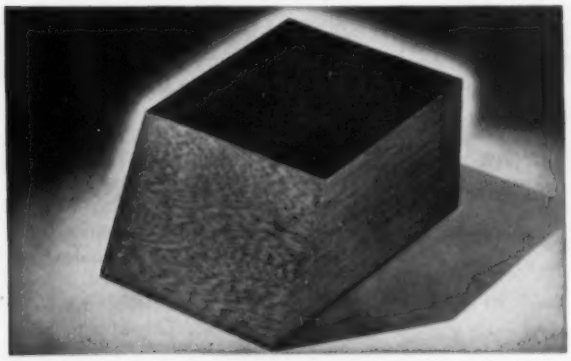
So C-D-F selects for your Dilecto insulation grade the correct, highest quality base material, paper, cotton, nylon, glass. These are used in combination with improved penetrating resins: Improved Phenolic, New Melamine, New Silicone, New Teflon, all synthetic, well polymerized resins.

Both the base and the resin are good insulators by themselves. But C-D-F sells them to you in an improved, practical form . . . Dilecto. Uniform sheets, tight tubes, strong rods, close tolerance machined and formed specialties, high bond strength metal clads.

Why does Dilecto combine so well mechanical strength with dielectric strength and dimensional stability? Because Dilecto is almost homogeneous, a true blend of resin and base.

DILECTO IS ALMOST HOMOGENEOUS

A poor laminate absorbs moisture at its edges, loses its insulating properties fast. Entrapped moisture and other volatiles within the cured structure causes inconsistent dielectric strength, with ultimate puncture and breakdown.



Punch press and bench saw operators know how much time and material is saved when the laminated plastic is *uniform* and *homogeneous* in nature like Dilecto.

DILECTO IS IMPROVED

Yes, C-D-F Dilecto is an improved laminated plastic, due to high standards and advances in resin and manufacturing techniques. It is watched by skilled workers in our modern plants, checked against rigid standards . . . C-D-F standards . . . by our quality control people. It is easy to machine, and the C-D-F shops are doing a booming business in specialties.

Table I—Typical Improved Phenolic Laminates

Commercial designation[a]	Resin	Filler	Improved properties	Improvement due to:
MEC-5	Phenolic	Nylon fabric	Insulation resistance; moisture resistance	Filler
XXHV-2[b]	Phenolic	Paper	High dielectric strength parallel to laminations	Resin and manufacturing technique
CRD	Phenolic	Cotton mat	Better machining	Filler
XXXP-26[b]	Phenolic	Paper	Insulation resistance; moisture resistance	Resin and manufacturing technique
C-92	Xylenol[c]	Cotton fabric	Alkali resistance	Resin
CF	Modified phenolic	Cotton fabric	Postforming	Resin

[a] All grades are Continental-Diamond Fibre Company.
[b] Resins have improved penetrating properties and the manufacturing techniques use these properties to provide better impregnation of the filler. Since thorough impregnation eliminates entrapped moisture and air, greater moisture resistance and better dielectric properties are attained. Manufacturing techniques also provide suitable temperature control during the curing stage to assure uniform quality and optimum property values in the finished laminate.
[c] Xylenol is essentially a dimethyl phenol.

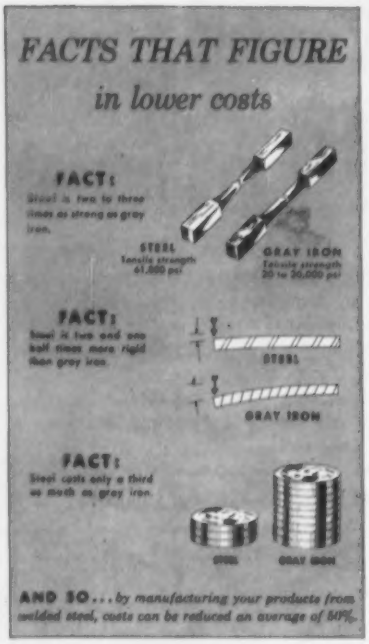
—from Electrical Manufacturing Article "Wider Design Opportunities with the NEW Phenolics", Part II.

The next time you think of laminated plastics, the name to remember is C-D-F Dilecto. The improved, high strength, uniform material that makes insulation buying and using more a science, less a puzzle. New grades, new applications, new savings are just part of the Dilecto success story. Look up the facts in Sweet's Design File, or write for catalog. Send us your blueprint for quotation . . . tell us your design dream . . . C-D-F wants to work with you.

C-D-F Continental-Diamond Fibre

CONTINENTAL-DIAMOND FIBRE DIVISION OF THE BUDD COMPANY, INC.

NEWARK 85, DELAWARE



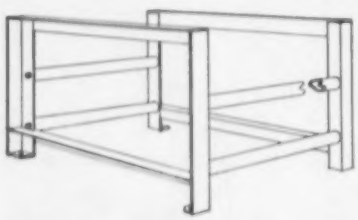
HOW WELDED STEEL BUILDS STRONGER PRODUCTS

... for lower cost

BY using welded steel design, material costs can be reduced up to 86% compared to using gray iron.

The amount of saving depends on how well the design utilizes steel's superior strength and rigidity.

The substantial saving in material cost leaves a wide margin in which to fabricate the steel by welding and still realize overall savings of 50% on many types of products.



Costs 23% Less. *Base for machine weighs 50% less than former casting construction, is stronger, more rigid, neater in appearance. Fabricated in only 6 hours . . . former design took 14 hours.*

How to design in steel

Handbook and bulletins on welded design are available to designers and engineers by writing:

THE LINCOLN ELECTRIC COMPANY
Dept. 1509
Cleveland 17, Ohio
THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT

National Metal Show

Philadelphia plays host to 37th National Metal Congress and Exposition . . . New developments in products and processes will draw interest of nation's executives and engineers.

Executives and engineers from all segments of the nation's metalworking industry will be out in force to hear and see firsthand the latest in techniques, processes, materials and equipment at the 37th National Metal Congress and Exposition. It will be held in Philadelphia's Convention Hall from Oct. 17 to 21 inclusive. It marks the sixth time this city has played the part of host for the huge annual event.

More than 400 leading firms will occupy nearly a quarter million square feet of floor space to display their products and processes. This year's show will be larger than the previous five shows staged in Philadelphia, but even more important is that this will undoubtedly be the most significant from the standpoint of exchanging information.

Societies participating in the affair are: the American Society for Metals; Institute of Metals Div., AIME; American Welding Society and the Society for Nondestructive Testing. Presentation of technical papers and discussion will take place in the headquarter hotels of the participating societies. For details on the technical programs, refer to the pages which follow.

Exhibitors at the Metal Show are listed alphabetically on p. 268. The list is broken down into product classifications, starting on p. 258, for the convenience of visitors at the show.

PROGRAM INDEX:

American Society for Metals ..... **P. 208**
ASM—Ordnance Research Joint Conference ..... **P. 229**
Institute of Metals Div.—AIME ..... **P. 233**
American Welding Society ..... **P. 247**
Society for Nondestructive Testing ..... **P. 252**
Industrial Heating Equipment Association ..... **P. 256**
Special Libraries Association ..... **P. 257**
Classified List of Exhibitors ..... **P. 258**
Alphabetical List of Exhibitors ..... **P. 268**

AMERICAN SOCIETY FOR METALS

Sessions at Ben Franklin

ANNUAL SEMINAR

THEORY OF ALLOY PHASES

Co-ordinator: Paul A. Beck, Univ. of Illinois.

Saturday, Oct. 15—9:30 a.m.

Bonding Forces in Solids—Fred Seitz, University of Illinois.

Band Theory of Bonding in Metals—J. C. Slater, Massachusetts Institute of Technology.

Density of States at Determined by Soft X-Ray Spectroscopy — C. H. Shaw, Ohio State University.

Saturday, Oct. 15—2:00 p.m.

Intermediate Phases and Electronic Structure—T. Massalski, University of Chicago.

Crystal Structure and Atomic Size—F. Laves, Polytechnic Technical Institute, Zurich, Switzerland.

Bonding Forces in Alkali Metals—Dr. H. Brooks, Cruft Laboratory, Harvard University.

Saturday, Oct. 15—8:00 p.m.

The Electronic Structure of Metals

and Alloys—L. Pauling, California Institute of Technology.

Sunday, Oct. 16—9:30 a.m.

Intermediate Phases in Alloys of the Transition Elements — Pol Duwez, California Institute of Technology.

Ferromagnetism, Antiferromagnetism and Crystal Structure — Clarence Zener, University of Chicago.

Atomic and Magnetic Ordering In Intermediate Phases — J. S. Kasper, General Electric Co., Schenectady.

Sunday, Oct. 16—2:00 p.m.

Atomic Moments of Transition Elements in Solid Solution Alloys—C. Shull, formerly Oak Ridge National Laboratory now associated with Massachusetts Institute of Technology.

Solid Solutions and Ordering — B. Averbach, Massachusetts Institute of Technology.

Alloy Phase Diagrams—G. V. Raynor, Birmingham University, England.

Technical Program

Monday, Oct. 17—9:30 a.m.

TITANIUM

The Rate of Diffusion of Carbon in Alpha and Beta Titanium — F. C. Wagner, Section Head, Physical Metallurgy, E. J. Bucur, Project Engineer and M. S. Steinberg, Head, Metallurgy Dept., Horizons, Inc., Cleveland, Ohio.

Hydrogen Contamination in Descaling and Acid Pickling of Titanium—G. A. Lenning, Principal Metallurgist, C. M. Craighead, Consultant and R. I. Jaffee, Chief, Nonferrous Physical Metallurgy Division, Battelle Memorial Institute, Columbus, Ohio.

Mechanical Properties of Ti-Cr-Mo-Alloys as Affected by Grain Size and Grain Shape—H. R. Ogden, Asst. Chief, F. C. Holden, Principal Metallurgist; R. I. Jaffee, Chief, Nonferrous Physical Metallurgy Division, Battelle Memorial Institute, Columbus.

Investigation of the Heat Treatability of the 6% Aluminum—4% Vanadium-Titanium-Base Alloy — R. G. Sherman, Res. Met., H. D. Kessler, Supervisor, Metallurgical Division, Titanium Metals Corporation of America, Henderson, Nevada.

TOUGH!

U. S. Patent #2184926
(Other patents pending)

Is your present abrasive tough enough to prove itself in performance? You can't judge an abrasive by looks, claims or promises. The only test of any abrasive is its *cost per ton of castings cleaned.* Because of exclusive metallurgical characteristics, Malleabrasive gives you the lowest cost per ton cleaned of any premium abrasive on the market! This has been proved in hundreds of production tests by users throughout the country. Prove it in your own production test—put muscle behind *your* blast cleaning with Malleabrasive! *We GUARANTEE that Malleabrasive will give you lowest cost per ton of castings cleaned.*

To order Malleabrasive, or for additional information on running a test, contact Globe Steel Abrasive Co., Mansfield, Ohio.

MALLEABRASIVE®

for FAST and SAFE Handling!

This sturdy, fast moving ⅜ yard machine has a lifting capacity up to 16,000 lbs. . . . swings in a full 360° circle. With the New FULL RANGE VISION Cab, the operator can SEE what he is doing, at all times. Promotes greater safety . . . speeds up the job. Other Challenger features include: *Self-aligning, Replaceable Hook Shoes . . . Force Feed Lubrication . . . Full Floating Trunnion-Mounted Tapered Drums . . . Straight-in-Line Engine Mounting with Torque Converter . . . Interchangeability of Parts, etc.*

Unit models are also available in ½ and ¾ yard Excavators . . . Cranes up to 20 tons capacity . . . Crawler or Mobile types . . . Gasoline or Diesel.

Send for Bulletin Now

UNIT CRANE & SHOVEL CORP.
4517 W. Burnham St. • Milwaukee 14, Wis., U.S.A.

Geared to boost your earnings!

A 8372-⅓-PC

PROGRAM

Monday, Oct. 17—9:30 a.m.

MECHANICAL PROPERTIES

Notch Ductile High Strength Nodular Irons—G. A. Sandoz, H. F. Bishop and W. S. Pellini, Metal Processing Branch Metallurgy Division, Naval Research Laboratory, Washington, D. C.

Fatigue and Anistropy in Copper—M. L. Ebner, Graduate Student and W. A. Backofen, Assistant Professor of Metallurgy, Metals Processing Lab., MIT, Cambridge, Massachusetts.

The Influence of Vibration on the Solidification of an Aluminum Alloy—R. S. Richards, Metallurgist, Titanium Metals Corporation, Henderson, Nevada and W. Rostoker, Supervisor, Physical Metallurgy Research, Armour Res. Foundation, Chicago, Illinois.

Metallographic Exhibit

The 10th Metallographic Exhibit of the American Society for Metals will be held at the National Metal Congress and Exposition in Philadelphia, Pa., during the week of October 17th to 21st, 1955.

Twelve classifications of micros are designated for the 1955 contest. Subjects include carbon and alloy steels; stainless steels and heat resisting alloys; cast and wrought iron; aluminum, magnesium, beryllium, titanium and their alloys; copper, nickel, zinc, lead and their alloys; metals and alloys not otherwise classified; micros showing transitions or changes during processing; welds and other joining methods; surface phenomena; results by unconventional techniques (not electron micrographs); slags, inclusions, refractories, and cermets; micrographs in color.

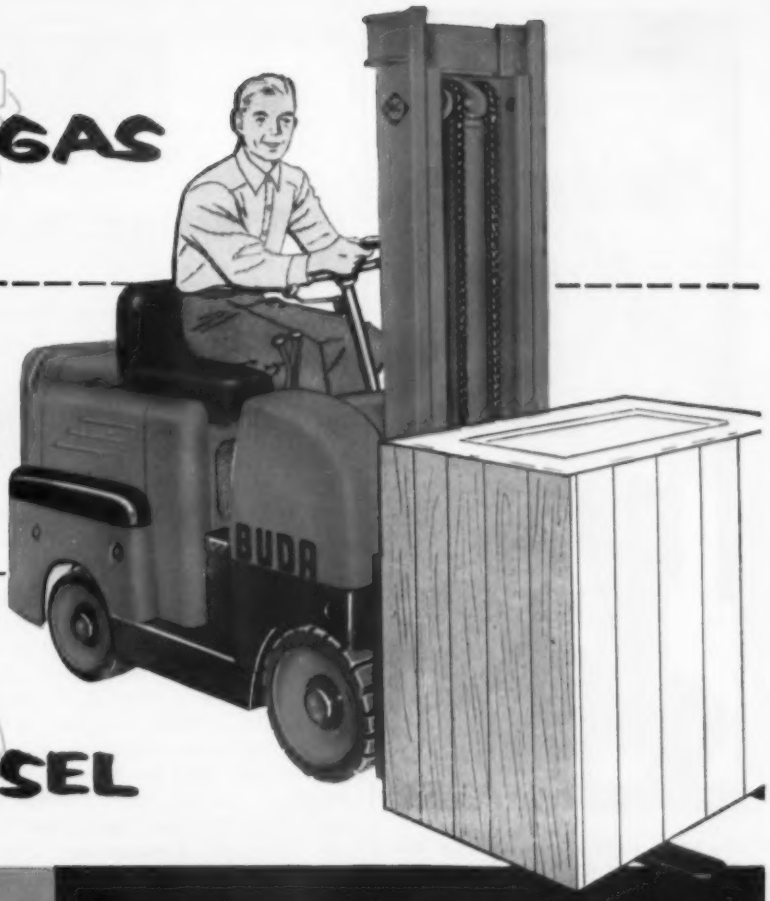
A grand prize of $100.00 cash will be presented for the best entry in the show. Blue ribbons will be given to the best entry in each of the 12 classifications, with honorable mentions to others.

(Turn to page 223)

L.P. GAS

GASOLINE

DIESEL



ALLIS-CHALMERS
(BUDA)

OFFERS YOU A CHOICE OF ENGINES
DIESEL, GASOLINE OR L-P GAS
ALL BUILT BY BUDA

Send for
Free Buda Booklet
Here's all the information you need in 36 fact-packed pages of lift truck illustrations and statistics. Write for free copy!

Whatever fuel you prefer – Gasoline, Diesel or L.P. Gas – Buda offers you an engine that is built heavier, built stronger, and built for longer, trouble-free service. Only Buda makes its own! This means the engine is specially designed, for the type of fuel to be used, by industrial engine experts for the Buda Fork Lift Truck – designed to do heavy jobs. Buda engines have 85% parts interchangeability, provide 30% longer life, have proven fuel savings of up to $500 a year. So, regardless of fuel – Gasoline, Diesel or L.P. Gas – Buda is a better buy.
Buda Division, Harvey, Illinois

ALLIS-CHALMERS

FORK LIFT TRUCKS

INDUSTRIAL TRACTORS

PLATFORM TRUCKS

THE
Number One Name
In Socket Screws & Keys
ALLEN

Don't take it for granted that any hex socket screw is an Allen. Your Allen Distributor *alone* can offer you

1. **ALLENPOINT SET SCREWS** with the new smaller point — proved by impartial laboratory tests to have greater locking power and vibration resistance, plus uniformly high shaft holding power, compared with conventional cup point screws and those with serrated or angled points.
2. **LEADER POINT CAP SCREWS,** for substantially reduced chance of thread injury or damage to threaded holes.
3. **ALLENOY STEEL** — with the strength and temper to permit the use of smaller sizes, and make button head and flat head screws practical despite necessarily shallower sockets.
4. **ALLEN PROGRESSIVE PRESSUR-FORMING,** producing contoured uncut fiber flow, from head to point. A process originated and perfected by Allen.

Be sure to get Allens in the black and silver striped box, sold only through leading Industrial Distributors. Write us for technical information.

Smelting: Automatic Charging

Selective charging system improves blast furnace operations . . . Increases output by 15 pct . . . Slips and hangings are greatly reduced.

An automatic selective charging system for blast furnaces which has increased output by 15 pct while reducing fuel consumption has been in operation for more than a year at the Oxelosund Ironworks near Stockholm, Sweden.

The Swedish system, patented and marketed by T. An. Tesch AB, Stockholm, is claimed to eliminate certain drawbacks of conventional shaft furnaces of circular horizontal section. In these furnaces, even if charged stock has been evenly distributed, the ascending gases seek the line of least resistance and tend to follow the walls of the furnace. Consequently, the volume of the furnace shaft is not utilized most efficiently, gases cannot act at full capacity. They may also form channels in the stock with resultant irregularities, "slips" and "hangings" occurring now and then.

Better Distribution

With the new system, stock to be charged is selectively and automatically distributed in the furnace shaft in such manner that the gasses on their way upward meet the same resistance in penetrating the charge at any point of the horizontal surface of the charged material. Gases near the walls are checked by a charge of denser nature or of more quantity, whereas in the intermediate and central parts of the shaft the gases meet material of coarser and more permeable character, which facilitate their passage. This results in a uniform flow of gases rendering the total volume of the shaft active.

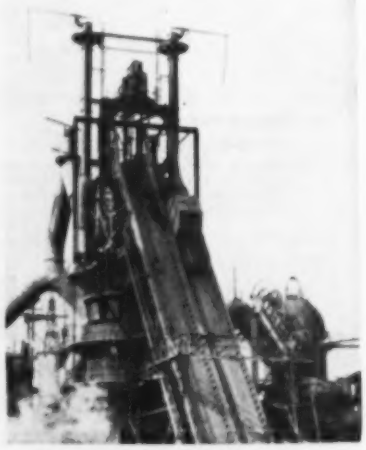
Uniform Operation

The Oxelosund Ironworks stated in a report on its 1954 activities that capacity of the new furnace was 15 pct higher than that of the old one, and a further improvement in output was noted for the first half of 1955. Volume of the new furnace is somewhat less, while the same stock, blowing engines, etc., were still used. The operation is claimed to be very uniform with slips and hangings being almost eliminated.

The new Swedish system for charging blast furnaces is reported to have attracted considerable interest among steel operating experts all over the world. The Oxelosund plant has already been visited by many experts interested in the operation.

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 237. Just indicate the page on which it appears. Be sure to note exactly the information wanted.



Better distribution . . .

Fabrication:

Welded aluminum trailer carries more payload.

A radically new, all-aluminum welded flatbed truck trailer weighing 7986 lb., and carrying a 45,000-lb pay load, has been in continuous service since Jan. 1, 1955, hauling pipe and structural steel over mountain highways in the Pacific Northwest.

The 35-foot trailer was designed by Kaiser Aluminum & Chemical Corp. and produced in a joint development program by Beall Pipe & Tank Corp., Portland, Ore. Beall is currently fabricating production models. The welded design is made possible by a new aluminum alloy—5083—developed to compete with mild steel in fabrication and welding costs.

High Magnesium Type

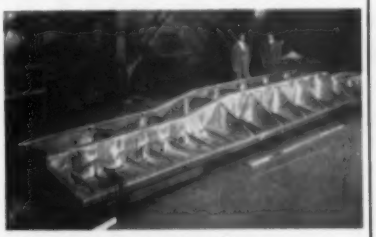
The alloy is a non-heat treatable, high magnesium type with good weldability using conventional semi-automatic processes. It was used for all aluminum components of the trailer.

Design was kept as simple as possible so that trailers can be fabricated with a minimum of production equipment including a press brake, power shear and inert-gas, shielded-arc, consumable electrode welding units. Fabrication proved relatively simple. The aluminum, a total of 3,120 pounds, was mill cut specifically for the trailer to keep scrap loss at a minimum.

Comparable Welding Cost

Experience during the prototype production and subsequent production model runs shows that welding by the semi-automatic process can be done at the same speed and cost using aluminum Alloy 5083 as steel. Total fabrication time per unit should be the same as for steel.

Flatbed and lowbed type trailers represent more than 20 pct of the total, according to government figures. Aluminum in various alloys is already used extensively for van type and other trailers.



Lightweight trailer . . .

Finishing:

Stainless steel wire has mirror-like finish.

A special stainless steel wire with a finish so lustrous that for many end-products subsequent finishing operations can be eliminated has been developed by National-Standard Co., Niles, Mich.

The wire's natural finish requires neither plating nor coating, and for most applications costs no more than regular stainless steel wire.

Typical Uses

Contrary to usual practice with stainless steel, the wire is used without additional polishing in such products as auto radio antenna tips, safety pins, picnic utensils like grilles and forks, and in toys. It also is used in women's wearing apparel and in wire form for various applications. For very high lustre, where electro-polishing is used, the finish substantially reduces time required for the operation.

The wire can be drawn from .030 to .090 in. and has a maximum tensile strength of 250,000 psi. The only other wire with such finish is diamond-drawn, but is not normally made in this range of sizes. The stainless wire has a perfectly smooth finish, free from scratches or flaws, and is rounder in shape than diamond-drawn wire.

KNIGHT FUME EXTRACTORS

KNIGHT Fume Extractors are designed particularly for the elimination of corrosive fumes from metal pickling, plating, and finishing operations.

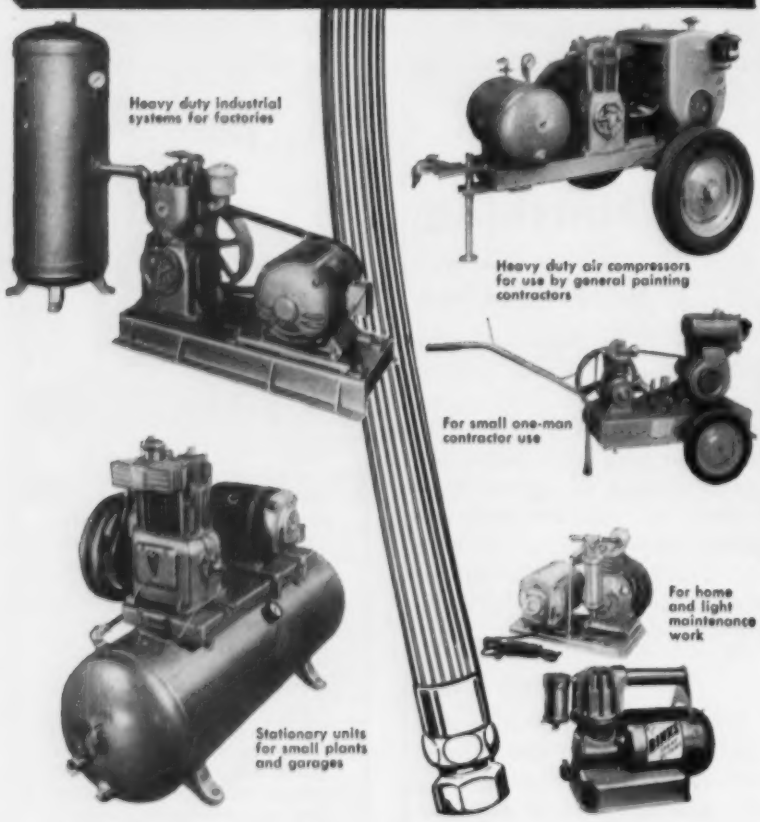
Fume extractors not only remove the entering acid fumes; but also, by the action of an internal entrainment eliminator, prevent the formation of mist from the scrubbing liquid. There is no objectionable acid fog being discharged into the atmosphere. In addition, acid effluent to the sewer can be eliminated by recirculation of a caustic solution in the extractor.

1) High scrubbing efficiency
2) Corrosion resistant throughout
3) High capacity, wide operating range
4) Low pressure drop, low power costs
5) No moving parts, simple to operate
6) Self cleaning, easily maintained

Consult KNIGHT engineers for assistance in the design of fume removal systems for your sulfuric acid tubs, chrome plating operations, or bright dip tanks.

Maurice A. Knight
310 Kelly Ave.
AKRON 6, OHIO

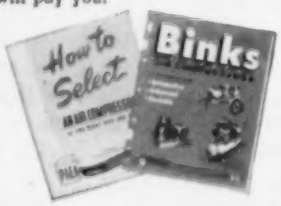
Binks Complete Line offers you
the right size and type of
AIR COMPRESSOR
to meet your special needs


Heavy duty industrial systems for factories
Heavy duty air compressors for use by general painting contractors
For small one-man contractor use
For home and light maintenance work
Stationary units for small plants and garages

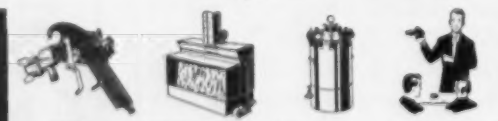
For each job there is an air compressor that is just right...one that gives you the volume and pressures you need with maximum flexibility and economy. The Binks Line of air compressors gives you a choice of 50 models from compact ¼ h.p. portable units to almost any size you need...each designed to do a specific job or to fit into a given air supply system. Before you buy or specify a new compressor, investigate the Binks Line...it will pay you!

To be sure you get the right compressor

Ask your distributor or write direct to us for copies of **HOW TO SELECT AN AIR COMPRESSOR** and **BINKS CATALOG 810.** They will tell you what to look for in an air compressor and show you available models, accessories, etc. No obligation.



Binks
EVERYTHING FOR SPRAY PAINTING



Binks Manufacturing Company
3124-30 Carroll Ave., West, Chicago 12, Illinois

119-55

REPRESENTATIVES IN PRINCIPAL U. S. & CANADIAN CITIES · SEE YOUR CLASSIFIED DIRECTORY

Cleaning:

Brushes clean pipe 10 times faster.

Power brushes are cleaning pipe in one-tenth the manhours formerly required for the operation using hand methods.

Pipe from 2- to 36-in. in diameter passes between the crimped wire brushes, which are manufactured by the Osborn Mfg. Co., Cleveland. The pipe emerges, after being fed through and back, clean and free of millscale and corrosion, ready for painting. The

Pipe cleaner . . .

brushes are chain-driven by a 32 hp motor. They are 0.020 diam wire, 12-in. OD.

Pipe rotates at approximately 40 rpm when 20-in. diam pipe is run.

Handling:

80-in. magnet crane transfers scrap faster.

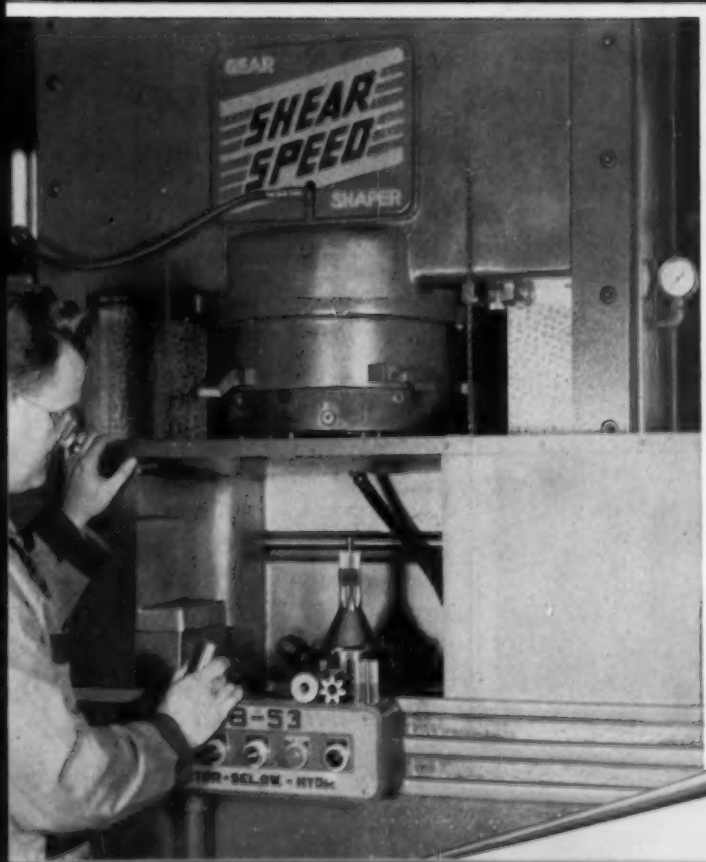
A large shipyard type crane equipped with an 80″ diameter lifting magnet is handling the transfer of scrap iron from railroad cars to ocean going vessels at a New York area dock.

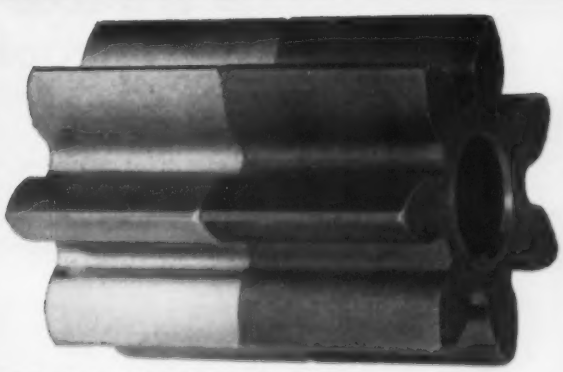
Ordinarily two 65″ magnets operating from independent cranes would be used to handle such a loading job, according to Lipsett, Inc., owners. However, development of the 80″ all-welded magnet, among the largest in the world, by Electric Controller & Mfg. Co., Cleveland, has permitted fast handling with just the one crane.

This Month's

GEAR PIX

RECORD SETTERS are these Shear-Speed gear shapers shown in final stage of assembly. More and more of these machines that cut all teeth simultaneously in a gear or similar toothed part are helping to set today's production pace.





CAST BLANK ON BOTTOM, steel blank on top, eliminates burrs when all teeth on both gears are cut simultaneously on Shear-Speed gear shapers. These mating automotive oil pump gears operate more smoothly due to close tolerances, smooth surface finishes, and perfectly formed 0.080-inch radii at the tooth fillets with no scallops or ridges. Three Shear-Speed gear shapers produce these gears for one of the best known automobiles.

MICHIGAN TOOL COMPANY

7171 E. McNICHOLS RD. • DETROIT 12, MICH.
IN CANADA: COLONIAL TOOL CO., LTD.

How to avoid costly trial and error when welding stainless

WELD WITH ARCOS

STAINLESS ELECTRODES

For truly *stainless* welds use ARCOS Electrodes. Trial and error electrode selection is risky when expensive equipment is involved—such as the food processing kettles pictured above. There's a complete line of ARCOS Electrodes—quality-controlled and ELECTROPAKED—to assure uniform performance in welding equipment that must withstand corrosive service. Try Arcos and see how easy it is to deposit sound welds—at low cost. ARCOS CORPORATION, 1500 South 50th St., Philadelphia 43, Pa.

The wide swing-travel of the crane and the lifting power of the magnet permits carrying large scrap loads directly from the cars

More efficient . . .

Steelmaking:

Cinder pot support extends life.

Life expectancy of cinder pots, has been increased by a new design improvement, according to E. W. Bliss Co's Mackintosh-Hemphill Div., Pittsburgh.

The improvement, available on Johnston corrugated cinder pots, consists of a short support which bolts into lugs on the underside of the slag car's bail ring. The old-style support extends up between the sides of the pot and the bail ring, hooking over the top of the ring from the inside. The new mounting method prevents the pot from scraping and banging against the backs of supports during transit from steel plant to slag dump.

Short-support pots have already been placed in service by divisions of two of the nation's largest steel producers.

Longer-lived pots . . .

Machining:

Carbide cutters speed milling operation.

Use of carbide in gang milling operation for machining abrasive cotton-impregnated Formica plug boards at International Business Machines Corp., Endicott, N. Y., has eliminated entirely the necessity of daily regrinding to maintain sharp cutter tips.

The Company uses a battery of Cincinnati milling machines to process thousands of the hard-to-machine boards to close tolerances for the electrical contacts of its tabulating equipment. Average gang of carbide-tipped cutters used on each machine, it is estimated, produces as many as 900,000 boards before being resharpened.

22 Slots Cut

The gang milling operation consists of producing 22 separate

Less resharpening . . .

slots in each Formica board. Slots are 0.162-in. wide, 0.020-in. deep and about 10 -in. long. Twenty-two cutters, each 5-in. in diameter, are mounted on the arbor of each milling machine. Each cutter in the gang includes eight teeth, and each tooth is tipped with grade 883 carbide.

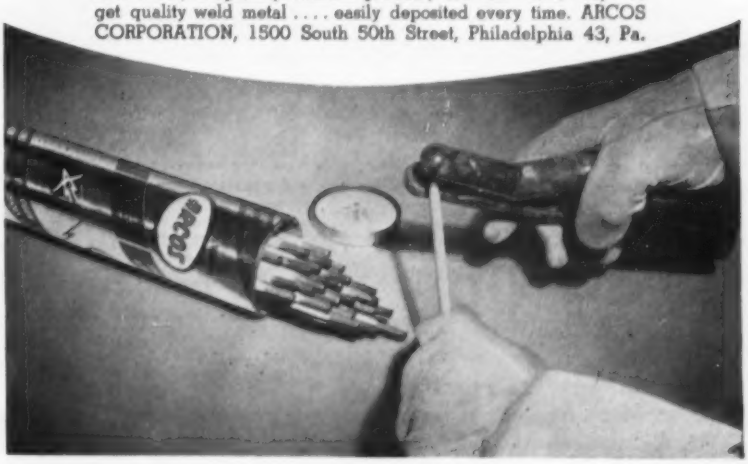
The machines are operated in rapid traverse at fastest possible rates of speed and feed.

A sure way to meet every demand when welding high strength steels

WELD WITH ARCOS

LOW HYDROGEN ELECTRODES

Low hydrogen electrodes are no "stepchild" at Arcos. They're manufactured under the same high standards as stainless—to meet exacting conditions. For example, welds in a dipper that will chew out 45 cu. yds. of stony soil in one bite must be strong, and must resist abrasion, shock and fatigue. Where strength is of primary importance, Arcos ELECTROPAKED Low Hydrogen Electrodes, frequently without preheat, are the "sure way" to get quality weld metal . . . . easily deposited every time. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.



"STUD" NELSON
END WELDS
HEAT EXCHANGER FINS
IN A FLASH!

The trigger-quick NELWELD® system offers practical end welding for the attachment of low-cost pin fins on heat exchangers. The same system is used on pressure-tight vessels where attachments must be made without piercing the shell.

THREE METHODS OF INCREASING HEAT TRANSFER WITH NELSON STUDS

1. HOLE, TAPERED OR KNURLED PIN, AND STUD
2. STUD ONE SIDE ONLY
3. TWO ACCESSIBLE SIDES

The NELWELD system is quicker and stronger than hand welding . . . costs less because it saves time. It is a method that provides a continuous heat path for maximum heat transfer . . . offers a logical solution to the problem of interior fins . . . provides positive pressure-tight welds . . . a minimum of warpage.

Why not call your nearest Nelson field engineer? He's an expert at reducing cost, and he'll be glad to assist you in analyzing your stud welding needs. Write for further information.

Stud Nelson

Fasten it Better at Less Cost with

NELWELD

NELSON STUD WELDING
2731 Toledo Avenue
Lorain, Ohio

Please send more information on stud welding wood to steel, and other cost-saving applications.

NAME _____

COMPANY _____

ADDRESS _____

CITY AND STATE _____

NELSON STUD WELDING DIV OF GREGORY INDUSTRIES, INC LORAIN, OHIO

Metals:

NBS analyzes cobalt-base jet engine alloys.

The National Bureau of Standards has developed an accurate procedure for analyzing cobalt-base jet-engine alloys through ion exchange, or the differential retention of metal ions on the surfaces of certain resins.

The procedure, which permits quantitative determination of nickel, manganese, cobalt, and iron in the presence of niobium, molybdenum, tantalum, tungsten, silicon, and copper, was designed particularly for the analysis of an S-816 type of alloy containing 40 pct cobalt, 20 pct nickel, 20 pct chromium, and 4 pct each of niobium, tungsten, and molybdenum. The remainder of the alloy is largely iron, manganese, carbon, and silicon.

Alloy Is Dissolved

First step in the analysis is to dissolve the alloy in aqua regia. The niobium, tantalum, tungsten,

Analysis by ion exchange . .

and silicon are then rendered insoluble by hydrochloric-acid dehydration. The solution is treated with hydrogen sulfide to precipitate molybdenum and copper, and filtered. Repeated evaporation of the filtrate with hydrochloric acid and hydrogen peroxide provides a chloride solution of the elements in the proper valence for the ion-exchange fractionation.

The solution of metal chlorides is then transferred to an anion-exchange column; and the nickel and manganese, with chromium

and some other elements, are collected in the first fraction by washing with 9 N hydrochloric-acid solution. Cobalt is collected in a second fraction by washing with 4 N hydrochloric acid, and iron in a third by washing with 1 N hydrochloric acid.

Making Determinations

The first fraction is divided into two parts, which are used to determine manganese and nickel by the persulfate-arsenite titration and dimethylglyoxime gravimetric methods. Cobalt is determined in the second fraction by electrolysis from a weakly ammoniacal chloride solution containing hydroxylamine hydrochloride, and iron is determined in the third fraction by reduction with stannous chloride and titration with dichromate.

Hardfacing:

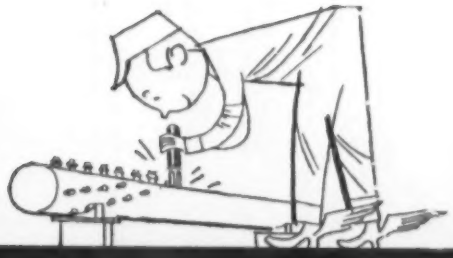
Alloy powders improve deposit efficiency.

A new series of alloy powders made by Wald Colmonoy Corp., Detroit, produces as much as 10 pct improved deposit efficiency when used in Spraywelded hardfacing applications.

Better deposit efficiency gained through improved techniques in manufacturing powders of the nickel - chromium - boron alloys means less powder is required to produce a given thickness of protective coating as sprayed on the workpiece. Lower hard-facing cost results from reduction in spray-welding time as well as in amount of material required.

Alloy Specifications

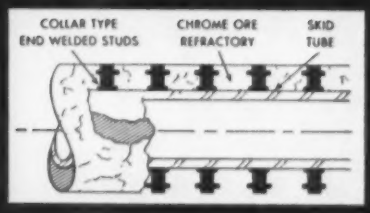
The alloy powders are available as Colmonoy No.'s 4, 5 and 6. No. 4 produces Rc hardness of 35-40. Its specific gravity is 8.22, its melting point 2025°F. No. 5 produces Rc hardness of 45-50. Has a specific gravity of 8.14, a melting point of 1950°F. No. 6 produces Rc hardness of 56-61. Its specific gravity is 7.80, its melting point 1900°F.



"STUD" NELSON
END-WELDS
INSULATION STUDS
IN A FLASH!

Encountering difficulty or high cost in securing or supporting insulation efficiently? If so, take a good look at the NELWELD® method.

NELSON® studs, end-welded in a split second, have solved hundreds of insulating problems for steel mills, all types of processing plants, and for manufacturers of boilers, heating and air conditioning equipment and tanks.



The NELSON collar stud, illustrated, is only one of many types that make insulating practical and profitable. Pins, hooks, rectangular studs, eye-bolts, split and slotted studs . . . fasteners for any kind of insulation . . . open up design possibilities without limit.

Your Nelson Field Engineer is a fastening expert, experience-trained to analyze your product designs at the blueprint stage . . . the point where remarkable savings can be realized. Write for details, indicating your problem.

Stud Nelson

Fasten it Better at Less Cost with

NELWELD®

NELSON STUD WELDING
2738 Toledo Avenue
Lorain, Ohio

Please send more information on securing insulation and other cost-saving NELWELD applications.

NAME _____

COMPANY _____

ADDRESS _____

CITY AND STATE _____

NELSON STUD WELDING DIV OF GREGORY INDUSTRIES, INC LORAIN, OHIO

DURASPUN

20-FOOT FURNACE ROLLS
Centrifugally Cast

. . . of Duraloy HH Alloy, one of the most widely used high chrome, medium nickel alloys.

Two items concerning these furnace rolls may be of particular interest:

a—the size: 20 feet long—14" OD, ¾" wall thickness

b—welding operations by which reducing cones and shafts (both statically cast of the same alloy) were welded to the centrifugally cast rolls

These two items will serve to emphasize two phases of our service: (1) the large size centrifugally cast tubes we are able to produce and (2) our machining and finishing facilities, including welding.

Our new 16-page general Bulletin — 3354-G — gives complete details. Would you like a copy? When writing or calling would you mind telling us the general nature of your high alloy casting requirements? Better yet, if you have specific requirements on which we could help, let us have the details.

THE DURALOY COMPANY

OFFICE AND PLANT: Scottdale, Pa.
EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.
DETROIT OFFICE: 23806 Woodward Avenue, Pleasant Ridge, Mich.
CHICAGO OFFICE: 333 South Michigan Avenue

Machining:

Suction chuck holds skin for milling.

A vacuum chuck developed by Convair Div. of General Dynamics Corp. provides 1000 suction cups to hold metal skin during milling operations and allows any shape skin to be placed on the chuck without complicated sealing off of vacuum source.

Licensed for production by Pioneer Tool Engineering, Inc., El Segundo, Calif., the chuck is fabricated from Pioneer 921-T, a specially alloyed cast aluminum tooling material. It has 100 pct stability under all temperature conditions, is lightweight and extremely rigid.

Suction cups are fitted with removable rubber grommets. A screw in the center hole serves as a shut-off valve for cups not required for a particular shape skin.

In operation, the upper chuck holds the pattern, lower chuck holds the material to be milled.

Suction holds work . . .

Fastenings:

Cap screws solve tightening problem.

Tightening molds on centrifugal casting machines presented Lebanon Steel Foundry, Lebanon, Pa., with a two-edged problem.

Tightening the carbon-steel, hexagon-head bolts too much stripped the threads. Tightening too little allowed molten metal to seep between mold and back plate,

WHY GROWL . . .

. . . OVER YOUR GRINDING WHEEL PROBLEMS? You'll solve them easily when you switch to CINCINNATI (PD) GRINDING WHEELS. Because *now* CINCINNATI Grinding Wheels offer POSITIVE DUPLICATION—the most talked about development in years. Positive Duplication is a remarkable achievement in precision manufacturing and quality control that can *save you money . . . and increase your production.*

Through the CINCINNATI (PD) Manufacturing Process you are assured Positive Duplication of the original wheel *every* time you reorder. "On grade" with a CINCINNATI (PD) WHEEL means all future (PD) WHEELS will act and grind exactly alike.

Yet CINCINNATI (PD) WHEELS are priced no higher than ordinary wheels.

Let us sink our teeth into your grinding wheel problems, and we'll have you purring like a kitten. Contact us and we'll send one of our representatives—men who know grinding and grinding machines as well as grinding wheels. Write, wire or telephone Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

Remember . . . *only* CINCINNATI Grinding Wheels give you . . . (PD) POSITIVE DUPLICATION.

CINCINNATI
Grinding Wheels
A Production-Proved Product of
THE CINCINNATI MILLING MACHINE CO.

forming a flange and preventing normal contraction during cooling. Surface cracks appeared which caused rejection of the casting.

Tightened to 1500 Ft-lb

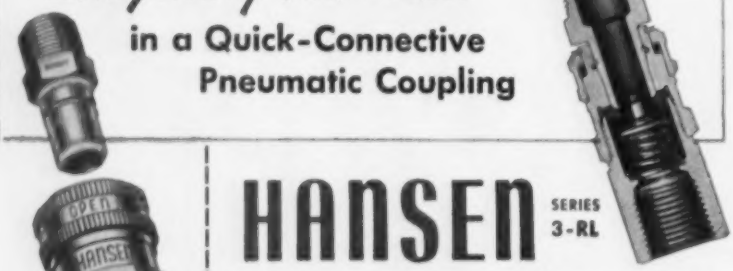
To solve the problem, the company replaced the carbon-steel bolts with Unbrako giant cap screws. They were able to tighten these fasteners made by Standard Pressed Steel Co., Jenkintown, Pa., to 1500 foot pounds—ample torque to give liquid-tight fit without damaging the threads. Rejection of castings for this reason was eliminated.

The giant cap screws, 1½ in. in diameter by 7-in. long, are upset forged from heat-treated alloy steel and have a rated tensile strength of 225,000-lb per cap screw.

The company also found that the fasteners eliminated trouble from permanent set or elongation, which had been experienced frequently with the carbon-steel bolts.

Improved fastening . . .

Everything You Want
in a Quick-Connective Pneumatic Coupling



HANSEN SERIES 3-RL
RING-LOCK COUPLING

On any job requiring ¾" to ⅛" connections—from the air line to the air tool—this single size Hansen Ring-Lock Coupling—with completely interchangeable Sockets and Plugs—does it all—makes it easy to keep stock of parts in balance—holds inventories to a minimum.

To connect, you merely push the Plug into Socket. To disconnect, just turn the sleeve. When Coupling is connected, a locking ring in Socket enters groove in Plug, provides positive lock and insures tight fit. Sockets with aluminum bodies are available for use with small hand-operated air tools.

- Smaller.
- Lighter.
- Effectively handles more volume than any other coupling of equal dimensions.
- Handles any job with fittings from ¾" to ⅛", from the air line to the air tool.
- All Series 3-RL Sockets and Plugs are interchangeable — reduces stock inventory to a minimum.
- One-way shut-off—for pneumatic service applications.
- Positive locking.
- Equipped with automatic sleeve lock.

Write for Descriptive Literature

SINCE 1915 — QUICK CONNECTIVE FLUID LINE COUPLINGS
THE HANSEN MANUFACTURING COMPANY
4031 WEST 150th STREET • CLEVELAND 11, OHIO

Mountings:

Vibration unit provides improved isolation.

New heavy-duty general purpose steel spring vibration mountings combine the superior characteristics of steel springs with unique damping, sway and thrust control elements to achieve a degree of isolation heretofore unattainable in a single mounting.

The mountings, developed by T. R. Finn & Co., consist of a cast semi-steel housing containing helical steel springs, rubber thrust bumpers, nylon dampers, and a steel base plate with sway control assemblies. A dual-purpose bolt secures the mounting to the machine and also provides an easy means of leveling.

Isolates vibration . . .

PROGRAM

(Continued from p. 210)

Monday, Oct. 17—2:00 p.m.

TITANIUM-ZIRCONIUM

Nature and Decomposition Kinetics of Alpha Prime in Titanium-Vanadium Alloys—F. R. Brotzen, Asst. Professor, Dept. Met., Rice Institute, Houston; E. L. Harmon, Res. Asst. and A. R. Troiano, Professor, Physical Met., and Head Dept. of Metallurgical Engineering, Case Institute of Technology, Cleveland, Ohio.

Metallography of Tempering of Alpha-Prime in Titanium Alloys—R. F. Domagala, Asso. Metallurgist and W. Rostoker, Supervisor, Armour Research Foundation of Illinois Institute of Technology, Chicago, Ill.

Tensile Properties of Zirconium-Chromium Alloys-Particle-Strengthening Effects—J. H. Keeler, Metallurgy and Ceramics Res. Department, General Electric, Schenectady, New York.

Progress in the Development of Creep-Resistant Zirconium Alloys—Walston Chubb, Battelle Memorial Institute, Columbus, Ohio.

Tuesday, Oct. 18—9:30 a.m.

TEMPERING OF STEEL

Some Effects of Silicon on the Mechanical Properties of High Strength Steels—C. H. Shih, B. L. Averbach, Associate Professor and Morris Cohen, Professor, Department of Metallurgy, Massachusetts Institute of Technology, Cambridge, Mass.

Some Relationships Between Endurance Limit and Torsional Properties of Steel—S. T. Ross, Project Engineer, R. P. Sernka, Res. Met., and W. E. Jominy, Chief Metallurgist, Engineering Division, Chrysler Corp.

The Influence of Molybdenum and Tungsten on Temper Embrittlement—A. E. Powers, Metallurgical Engineer, Materials & Processes Lab., General Electric Co., Schenectady.

Hardness of Tempered Martensite in Carbon and Low-Alloy Steels—R. A. Grange, Fundamental Res. Laboratory and R. W. Baughman, United States Steel Corp., Kearny.

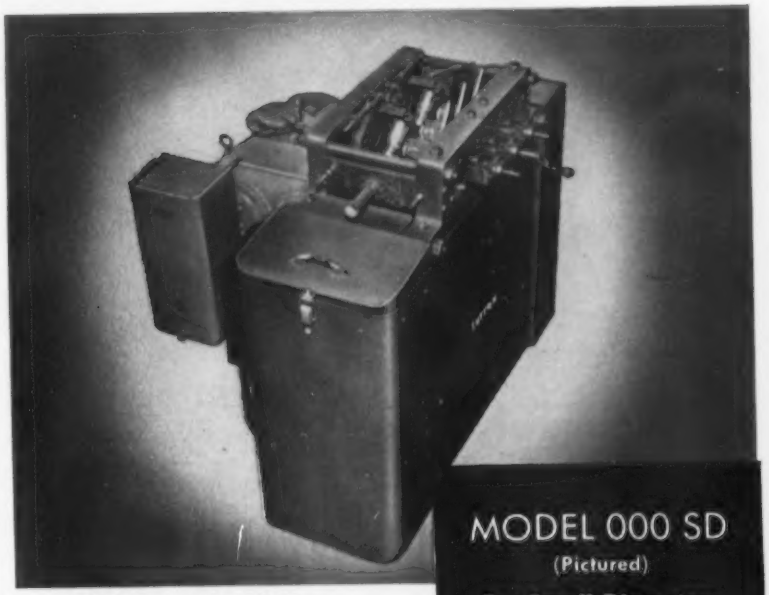
Tuesday, Oct. 18—9:30 a.m.

DEFORMATION

Deformation of Beryllium Single Crystals at 25 to 500°C.—H. T. Lee and R. M. Brick, School of Metallurgical Engineering, University of Pennsylvania, Philadelphia.

NEW SUTTON *Syncro-Drive*

STRAIGHTENERS



MODEL 000 SD
(Pictured)
For Small Diameters
1/16" to 3/8" O.D.
OTHER SIZES AVAILABLE

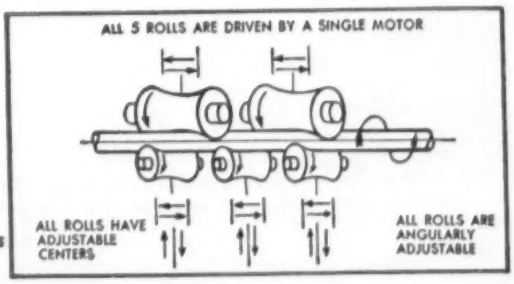
- **ENTIRELY GUIDELESS**
- **HIGH PRODUCTION SPEEDS UP TO 400 FEET PER MINUTE**
- **ALL ROLLS ARE DRIVEN**

For accurate straightening of tubes and bars in steel, stainless, aluminum, brass, inconel and other modern metals. Syncro-Drive automatically centers material in pass line without use of guides. Each size machine handles a wide range of sizes for extreme flexibility.

EXCLUSIVE
Syncro-Drive
(Patent Pending)

Roll speeds are coordinated automatically by the new Syncro-Drive for better straightening and longer roll life.

Set Up and Size Changes are fast and easy



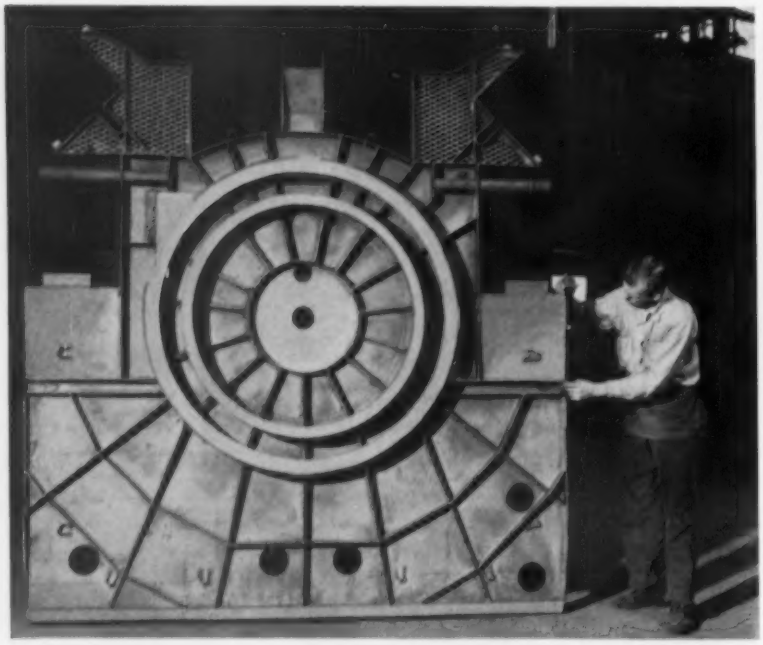
Ask for Data and Bulletin No. 25

SUTTON *Engineering* COMPANY

Manufacturers for Ferrous and Non-Ferrous Metal Industries

STRAIGHTENERS, EXTRUSION PRESSES, HYDRAULIC STRETCHERS, SHEET LEVELERS, CONTOUR CORRECTING MACHINES, STRAIGHTENING PRESSES, ROTARY CLEANERS, HEAVY-DUTY UNIVERSAL JOINTS, ROLLS

FIRST NATIONAL BANK BLDG., PITTSBURGH 22, PENNSYLVANIA
PHONE: GRANT 1-8077 **PLANT: BELLEFONTE, PA.**

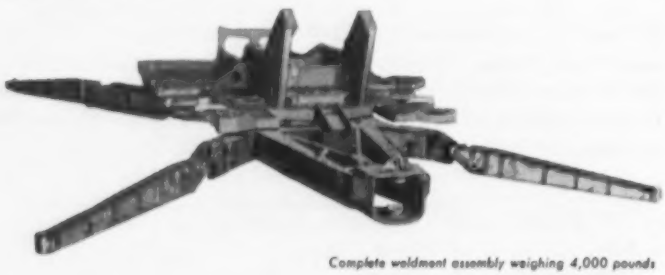


Upper section of gun carriage

168 OF THESE HEAVY WELDMENTS DELIVERED ON SCHEDULE BY BRANDT

These gun carriage weldments, SHAPED from various steels (including low-alloy, high-tensile steel), WELDED to meet Brandt's X-ray inspection, MAGNAFLUXED, STRESS-RELIEVED and SANDBLASTED.

Quality workmanship to comply with rigid ordnance specifications and close tolerances.



Complete weldment assembly weighing 4,000 pounds

The heavy weldment illustrated is another demonstration of the successful coordination of Brandt's 64 years of metalworking experience and its extensive and modern facilities.

Actually Brandt is a specialist in all types of FORMINGS, STAMPINGS, WELDMENTS . . . in any size, and in any kind of metal.

FOR MANUFACTURING EXECUTIVES . . .

A comprehensive brochure, picturing the facilities at Brandt sent upon request.

BRANDT
BALTIMORE

CHARLES T. BRANDT, INC.
1700 Ridgely Street, Baltimore 30, Md.

Grain Boundary Creep in Aluminum Bicrystals—F. N. Rhines, Professor of Light Metals, W. E. Bond, Res. Assistant and M. A. Kissel, Res. Assistant, Carnegie Institute of Technology, Department of Metallurgy, Metals Res. Laboratory, Pittsburgh, Pa.

Deformation and Fracture Mechanisms of Polycrystalline Magnesium at Low Temperatures—F. E. Hauser, P. R. Landon and J. E. Dorn, Professor of Physical Metallurgy University of California, Department of Engineering, Berkeley, Calif.

Influence of Cold Work on Strength of Steel at Elevated Temperatures — Paul Shahinian, High Temperature Alloys Branch, Metallurgy Division Naval Research Laboratory.

Tuesday, Oct. 18—2:00 p.m.
STEEL

Inhibition by Nitrogen of Graphitization in Steel — G. V. Smith, Bard Professor of Metallurgical Engineering, Cornell University, and B. Royle, American Steel & Wire Div.

An Approach to the Study of the Effect of Rare-Earth Additions to Steel by Use of Radioactive Tracer Techniques—C. S. DuMont, Associate Consultant, J. E. Gates, Res. Radiochemist, Battelle Memorial Institute, Columbus, and C. N. Henderson, Mallinckrodt Chemical Works, St. Louis.

The Optimum Boron Content for Hardenability—J. C. Shyne, Metallurgy Department, E. R. Morgan and D. N. Frey, Ford Motor Company.

On Banding in Steel—C. Jatczak, Res. Met., D. J. Girardi, Res, Met., and E. S. Rowland, Chief Metallurgical Engineer, The Timken Roller Bearing Co., Canton, Ohio.

"It seems to have picked up a strange whining noise."

PROGRAM

Wednesday, Oct. 19—2:00 p.m.

STEEL

Some Effects of Metal Removal and Heat Treatment on the Surfaces of Hardened Steel—Karl E. Beu, Supervisor, Physical Measurements Dept., Goodyear Atomic Corp., Portsmouth, Ohio and Donald P. Koistinen, Physics-Instrumentation Dept., Research Laboratories Division General Motors Corp., Detroit.

Effect of Temperature on Delayed Yielding of Mild Steel for Short Loading Duration — Josephy M. Krafft, Mechanics Division, Naval Res. Lab., Washington, D. C.

Effect of Tempering Temperature on Stress Corrosion Cracking and Hydrogen Embrittlement of Martensitic Stainless Steels—Peter Lillys, Res. Met., and A. E. Nehrenberg, Supervisor, Res. Lab., Crucible Steel Company of America, Pittsburgh.

Static Fatigue of High-Strength Steel —R. H. Raring, Head Ferrous Alloys Branch Metallurgy Division and J. A. Rinebolt, Naval Research Laboratory, Washington, D. C.

Wednesday, October 19

ASM ANNUAL MEETING

Campbell Memorial Lecture

Robert H. Aborn

United States Steel Corp.

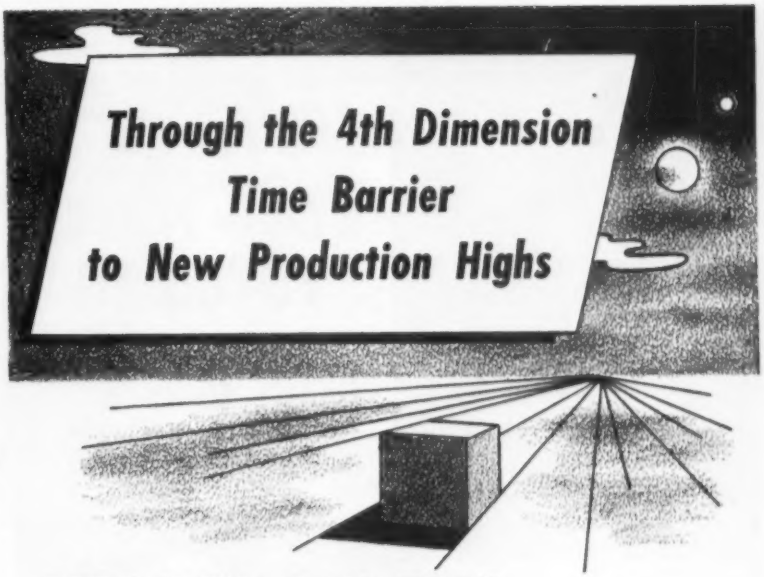
Wednesday, Oct. 19—2:00 p.m.

MOLYBDENUM-VANADIUM-TANTALUM

The Initiation of Discontinuous Yielding in Ductile Molybdenum—J. A. Hendrickson, Res. Assistant; D. S. Wood, Asst. Professor of Mechanical Engineering, and D. S. Clark, Professor of Mechanical Engineering California Institute of Technology, Pasadena, California.

Properties of Vanadium Consolidated by Extrusion—C. E. Lacy and C. J. Beck, General Electric Co., Knolls Atomic Power Lab., Schenectady, New York.

The Mechanical Properties of Vanadium-Base Alloys—W. Rostoker, A. S. Yamamoto, Supervisor, Physical Metallurgy Res., Armour Res. Foundation of Illinois, Chicago and R. E. Riley, Res. Met., Rem-Cru Titanium Corp., Midland, Pa.



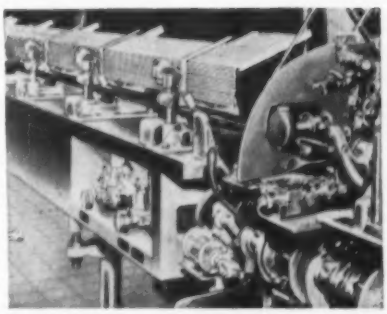
LIPE AML BAR FEED

gears machine production to the steady flow of Time

ALL industrial results are achieved in Time . . . *vital 4th dimension that measures output, costs, profit.* Shorten the time gap between operations . . . shorten the time when machines are "cutting air" . . . keep machines producing at a steady optimum rate during the fatigue slow-down from 10:30 to noon, and from 3 P.M., till closing time . . . *and you are getting 4th Dimension production.* Production that is geared to the steady flow of Time.

Lipe AML Bar Feed Produces from 30% to 100% More Output by Eliminating Time Losses . . .

Time losses account for the enormous differences in output among workmen. By eliminating these losses automatically, the Lipe AML Bar Feed boosts overall production from 30% to 100%. That's because stock is fed to the machine independent of the operator. Constant pressure behind the stock assures uniform speed of feed. No feed fingers to fail or mar stock. No multiple feed-outs, even on the longest pieces.



Mail the coupon now for free literature giving full details on the Lipe AML Bar Feed.

LIPE ROLLWAY

LIPE ROLLWAY CORPORATION
Syracuse 4, N. Y.

Sure, I'd like to know more about the Lipe AML Bar Feed. Send me your free booklet.

Name_____ Title_____

Company_____

Street_____

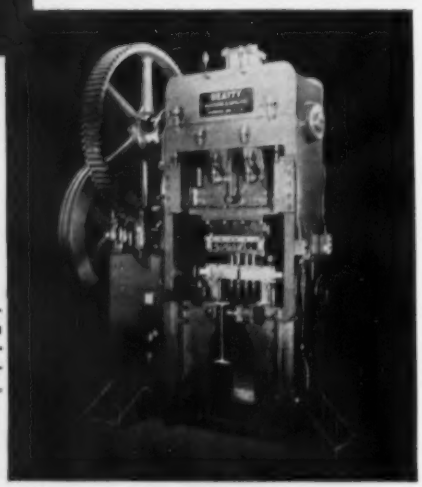
P.O._____ Zone_____ State_____

FASTER

WEB and FLANGE PUNCHING

Beatty Built-in Adjustable Tools Save Set-up Time

GUILLOTINE BEAM WEB PUNCH
Six individually controlled punching units with automatically synchronized punch and die, facilitate setting up to various gauge lines. 33" max. setting to outside units; 2⅜" min. setting between units. 200 ton cap.



GUILLOTINE BEAM FLANGE PUNCH
A turn of a handwheel changes punching centers and synchronizes punch with die. Four punching units, with 2¼" - 6¾" setting between inside and outside punches, adjustable 2¼" - 3½". 200 ton cap.

BEATTY Spacing Table handles web and flange punching without roll adjustment.

BEATTY Guillotine Beam Punch. Punches webs and flanges in "I" beams from 6 to 30 inches.

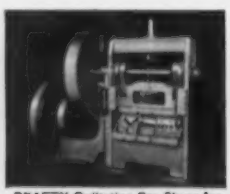
REDUCE COSTS ON "SHORT-ORDER" PUNCHING

Take the high costs out of "short order" punching with these versatile BEATTY Guillotine Beam Punches. They're especially designed to reduce costs in handling short run web and flange punching where punching arrangements are frequently changed.

Incorporating entirely new time-saving *adjustable* tools that eliminate expensive setting up time, reduce down time . . . these BEATTY machines have lowered costs by as much as 75% on some metal fabricating jobs.

Dependable, accurate fast . . . BEATTY machines (standard models or custom-built to your specifications) can help solve your metal fabricating problems — reduce costs. Talk it over with a Beatty engineer!

BEATTY Gap Type Press for forming, bending, flanging, pressing. 250 ton cap.



BEATTY Guillotine Bar Shear for angles, bars, rounds squares without changing tools.

BEATTY
MACHINE & MFG. CO.
HAMMOND, IND.

PROGRAM

Rolling Textures in Tantalum in Relation to BCC Metals—J. W. Pugh and W. R. Hibbard, Jr., Metallurgy and Ceramics Res. Dept., General Electric Co., Schenectady, New York.

Thursday, October 20

ASM ANNUAL BANQUET

Principle Speaker
Lewis L. Strauss
Chairman,
U. S. Atomic Energy Commission

Thursday, Oct. 20—9:30 a.m.

STAINLESS STEELS

Influence of Alloying Elements on the Impact Transition Behavior of 12% Cr Steels Aged at 900°F. — E. J. Whittenberger, Chief Development Metallurgist and E. R. Rosenow, Physicist, United States Steel Corporation, Chicago, Illinois (South Works).

Creep Rupture Properties of Cold Worked Type 347 Stainless Steel—N. J. Grant, Associate Professor, A. G. Bucklin, Staff Member and Warren Rowland, Res. Asst., Department of Metallurgy, MIT, Cambridge, Massachusetts.

Notch Ductility of Type 410 (12% Cr) Stainless Steel—F. A. Brandt, H. F. Bishop and W. S. Pellini, Metal Processing Branch Metallurgy Division, Naval Research Laboratory, Washington, D. C.

The Influence of Strain Rate and Temperature on the Ductility of Austenitic Stainless Steel—G. W. Form, Res. Assistant and W. M. Baldwin, Jr., Professor, Metals Research Laboratory, Case Institute of Technology, Cleveland, Ohio.

Thursday, Oct. 20—2:00 p.m.

STAINLESS STEELS

High Nitrogen Austenitic Cr-Mn Steels—V. F. Zackay, Res. Engineer, Scientific Laboratory, Ford Motor Co., Dearborn, Michigan; J. L. Carlson, Metallurgical Engineer, Hoskins Mfg. Co., Detroit, Michigan and P. L. Jackson, Res. Metallurgist Misco Precision Casting Co., Whitehall, Michigan.

The Effect of Composition and Structure on the Creep Rupture Properties of 18-8 Stainless Steels—F. C. Monkman, P. E. Price and N. J. Grant, Department of Metallurgy, Massachusetts Institute of Tech-

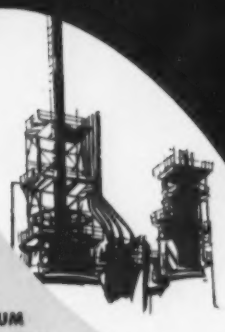
Showing the Way to More Economical Uses of Steel!

Where High Temperatures Are a Problem—

Alumicoat

Molten Aluminum Coating Process

PROTECTS STEEL—
CHECKS CORROSION & HEAT OXIDATION



PETROLEUM REFINERY EQUIPMENT

The ALUMICOAT Process protects refinery equipment against high temperature corrosion. ALUMICOAT offers a firm resistance against corrosive media especially sulphur compounds and extreme temperatures.

JET ENGINES
ROCKET MOTORS
GUIDED MISSILES

The ALUMICOAT Process has made possible the use of Chrome Moly Steels which have high physical strength. These steels would ordinarily oxidize and scale, but after application of the ALUMICOAT Process they have proven superior, in many cases, to strategic alloy steels.

In the ALUMICOAT Molten Coating Process, parts are dipped in molten aluminum to produce a metallurgical iron-aluminum bond at the interface, and a surface overlay of pure aluminum. At temperatures exceeding the melting point of aluminum, the aluminum on the surface diffuses. This diffused coating, together with the iron-aluminum bond, provides a refractory material that gives steel maximum protection against high temperature scaling.

SUPER HEATER SUPPORT BRACKETS
PISTON HEADS & RINGS
HEAT TREATMENT EQUIPMENT

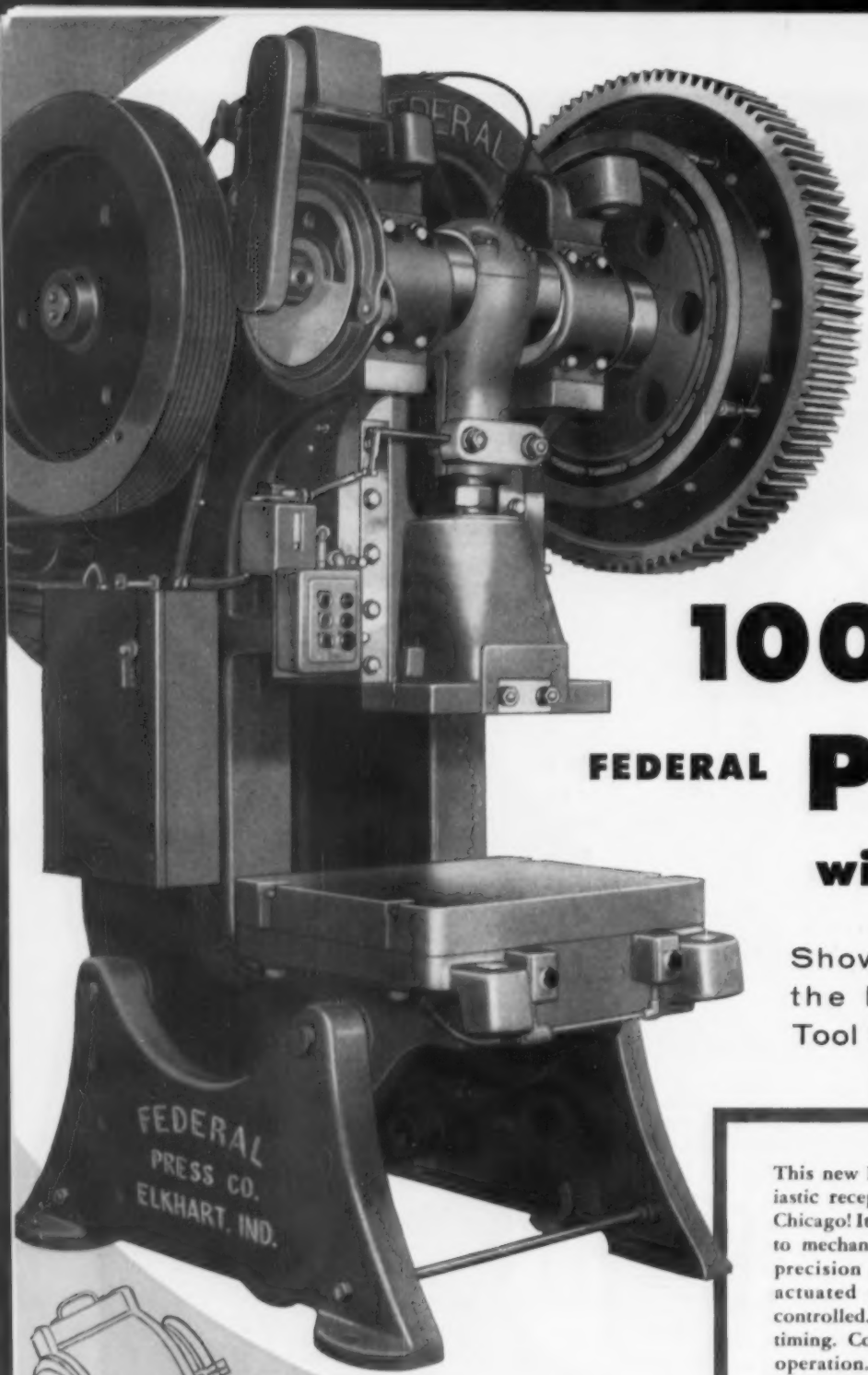
These are but a few of the many applications in which the use of the ALUMICOAT Process is effecting greater and greater savings!

GET THE COMPLETE ALUMICOAT STORY IN BOOTH 1808 NAT'L METAL EXPOSITION & CONGRESS

or write for full details

ARTHUR TICKLE ENGINEERING WORKS, INC.

21-22 Delevan Street • MAin 5-4200 • Brooklyn, N. Y.



Introducing the new

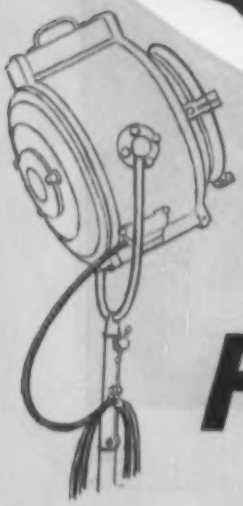
100-TON FEDERAL PRESS

with air clutch

Shown for first time at the National Machine Tool Show in Sept., 1955

This new Federal Press enjoyed an enthusiastic reception at its premier showing in Chicago! Its many outstanding features bring to mechanical presses a new standard of precision and safety at high speed. Air-actuated clutch. Electro-pneumatically controlled. Dual-solenoid safety valve. Inch-timing. Continuous as well as single-cycle operation. This new Federal Press embodies the same high quality materials and workmanship that have distinguished Federal construction for more than 30 years.

FEDERAL PRESS COMPANY
502 Division Street, Elkhart, Indiana



Write for new catalog today!

FEDERAL *Quality Leadership* PRESSES

30 Years of Quality Construction

nology, Cambridge, Massachusetts.

Austenitic Fe-Cr-C-N Stainless Steels—G. F. Tisinai, Res. Engineer, J. K. Stanley, Section Head and C. H. Samans, Associate Director, Engineering Research Dept., Standard Oil Co., Indiana.

Effects of Chemical Composition and Heat Treatment Upon the Microstructure and Corrosion Resistance of AISI Types 309 and 310—D. J. Carney, Chief Dev. Met., and E. R. Rosenow, Physicist, U. S. Steel Corp., South Works, Chicago, Illinois.

AMERICAN SOCIETY FOR METALS

LECTURE ON EMBRITTLEMENT PHENOMENA

BY

B. R. QUENTEAU

Chief Metallurgist, U. S. Steel Corp., Duquesne, Pa.

Tuesday, Oct. 18—4:30 p.m.

Summary of Embrittlement Phenomena and General Discussion of Their Effects.

Tuesday, Oct. 18—8:00 p.m.

Work Hardening and Precipitation Embrittlement.

Wednesday, Oct. 19—4:30 p.m.

Embrittlement by Gases.

Wednesday, Oct. 19—8:00 p.m.

Temper Brittleness and Sigma Phase.

ORDNANCE RESEARCH — ASM JOINT CONFERENCES

DUCTILE CHROMIUM METALS AND ITS HIGH ALLOYS

Monday, Oct. 17—10:30 a.m.

WORLD WIDE RESEARCH ON DUCTILE CHROMIUM

Chairman—J. W. Dawson, Director, Chemical Sciences Division, Office of Ordnance Research, U. S. Army.

Introductory Remarks—Col. P. N. Gillon, Ordnance Dept., U. S. Army.

Research on Chromium in America—W. J. Kroll, Consulting Metallurgist.

Research on Chromium in Australia—Henry L. Wain, Department of Supply, Government of Australia.

METAL TURNINGS TO METAL CHIPS...
One of four American #3800 Crushers installed in a General Motors plant for the processing of metal turnings.

...FOR AMERICA'S BLUE CHIP COMPANIES with American METAL TURNINGS Crushers

WHY an AMERICAN installation makes Dollars and Sense:

These cost-conscious companies have long-since learned that American-crushed metal turnings quickly recover an initial American Crusher investment in these important ways:

$3 to $4 Extra Profit Per Ton: With higher scrap values for metal chips over ordinary machine shop turnings, a daily crushing capacity of only 2 tons will produce $1200.00 per year in extra profits.

Up to 80% Less Space: Reduction to metal chips solves many expensive handling and storage problems, and allows easy briquetting.

30-50 Gallons Per Ton Cutting-Oil Recovery: An important reclamation that adds new profits with an American Crusher installation.

PROMINENT AMERICAN CRUSHER USERS

The users of American Metal Turnings Crushers read like a "Who's Who" of American Industry. Included are such names as:

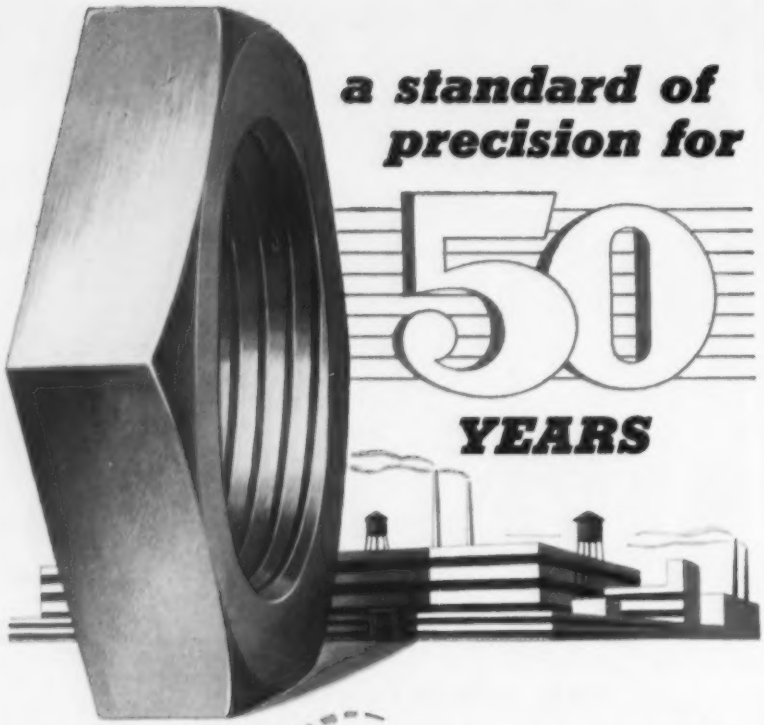
GENERAL MOTORS • FORD TIMKEN • ALLIS-CHALMERS GENERAL ELECTRIC • BUDD WHEEL • CHRYSLER.

Write for Bulletin "METAL TURNINGS CRUSHERS"

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1439 MACKLIND AVE. ST. LOUIS 10, MO.

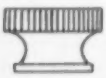


a standard of precision for 50 YEARS

"Fischer Turned"

BRASS AND ALUMINUM NUTS

HEXAGON CAP NUTS



KNURLED THUMB NUTS

DOUBLE CHAMFERED HEXAGON NUTS

SINGLE CHAMFERED HEXAGON NUTS

Fifty years of manufacturing "know-how" stand behind Fischer brass and aluminum nuts. Combining this experience with special high-speed machinery, Fischer supplies precision *turned* nuts at prices competitive with those produced by other methods . . . cuts normal delivery time to absolute minimum.

New economies in assembly operations are possible with Fischer nuts because each is burrless . . . tapped square with the face . . . cleaned and degreased . . . countersunk on both sides . . . tapped to Class 2 tolerances.

Specify Fischer turned brass and aluminum nuts to fill all of your requirements. An extensive line of standard nuts is offered, and "specials" are produced with speed and economy . . . many types so regularly that they have virtually become "standards" at Fischer.

Write today for new complete catalog.

1905-1955 50th ANNIVERSARY FISCHER SPECIAL MFG. CO. CINCINNATI, OHIO

C-216-FS

Fischer SPECIAL MFG. CO.

445 MORGAN ST. • CINCINNATI 6, OHIO

Research on Chromium in Chromium in Europe—A. H. Sully, Fulmer Research Institute, England.

Monday, Oct. 17—2:00 p.m.

PHYSICAL METALLURGY OF HIGH-CHROMIUM ALLOYS

Chairman—J. H. Holloman, Manager, Metallurgy and Ceramics Research Department, General Electric Research Laboratory.

Influence of Chromium Metal Purity on the Properties of Chromium Alloys — Robert I. Jaffee, Battelle Memorial Institute.

The Solubility of Nitrogen and Oxygen in Solid Chromium — A. A. Burr, Rennselaer Polytechnic Institute.

The Ternary System of Chromium-Nickel Alloy Containing up to 5% Nitrogen—N. J. Grant, Massachusetts Institute of Technology.

Oxidation of Chromium and Chromium Alloys—W. Martin Fassel, Jr., University of Utah.

The Kinetics of the Formation of the Sigma Phase in Chromium-Iron Alloys—Pol Duwez and Howard Martens, California Institute of Technology.

Tuesday, Oct. 18—9:00 a.m.

CHROMIUM METAL

Chairman—A. B. Kinzel, Vice-President (Research), Union Carbide & Carbon Corp.

Preparation and Properties of Iodide Chromium—I. E. Campbell, Battelle Memorial Institute.

Electrowinning of Chromium from Trivalent Solutions—M. C. Carosella and J. D. Mettler, Electro Metallurgical Co.

Melting Point of High-Purity Chromium—LeRoy L. Wyman, National Bureau of Standards.

Mechanical Properties of Massive Chromium—G. Asai and K. D. Deardorf, U. S. Bureau of Mines.

Effects of Impurities on the Ductility of Chromium—W. H. Smith and A. U. Seybolt, General Electric Co.

Volume Change and Evolution of Gases on Heating Electrolytic Chromium—Kenneth A. Moon and George A. Consolazio, Watertown Arsenal.

Tuesday, Oct. 18—2:00 p.m.

HIGH-CHROMIUM ALLOYS

Chairman—P. R. Kosting, Metallurgist, Watertown Arsenal Laboratories.

PROGRAM

Ductile Chromium-Iron Alloys—R. W. Fountain and J. L. Lamont.

Toughness and Mechanical Properties of Chromium-Iron Alloys—H. Kato and E. T. Hayes, U. S. Bureau of Mines.

Creep Rupture Properties of Chromium-Nickel Alloys—N. J. Grant, Massachusetts Institute of Technology.

A Forgeable Chromium-Iron Based Alloy—D. P. Moon, H. A. Blank and A. M. Hall, Watertown Arsenal.

Metallography of Chromium and Chromium-Rich Alloys—W. D. Forgeng and G. T. Motock, Union Carbide & Carbon Research Laboratories.

Thursday, Oct. 20—9:30 a.m.

POWDER METALLURGY IN ATOMIC ENERGY

General Chairman—Henry H. Hausner, Manager of Atomic Energy Engineering, Sylvania Electric Products, Incorporated.

General Metallurgical Problems in the Design of Nuclear Power Reactors—Vincent P. Calkins, Aircraft Nuclear Propulsion Project, General Electric Company.

Preparation of Metal Powders for Nuclear Reactor Purposes—Premo Chiotti and Harley A. Wilhelm, Institute for Atomic Research, Iowa State College.

The Latest Developments in the Theory of Sintering — Leslie L. Seigle, Head Fundamental Metallurgy Section, Sylvania Electric Products, Inc.

"I see the boss has been talking turkey to the men again."

thumbs down
on high handling costs

A Conco Crane, custom-designed for a specific application, can cut costs sharply. A modest crane investment can return important profits. Let a Conco engineer show you how. Write for a representative to call, or ask for Bulletin 3000A covering the complete Conco Crane line—a line backed by 37 years experience.

CRANES HOISTS
CONCO

CONCO ENGINEERING WORKS
Division of H. D. Conkey & Company
15 Grove St., Mendota, Illinois

AFFILIATES:
Conco Engineering Works — Domestic Heating Equipment
Conco Building Products, Inc. — Brick, Tile, Stone

Forged-in pockets provide tougher, stronger dies

This 35,000-pound die block, made of Finkl FX-T3 steel, has a forged-in pocket 12″x29″x34″. In addition to the improved physical properties, the pocket forging increases the saving in machining time. There are many ways, such as this, that Finkl engineers can help you when planning die block or forging requirements.

When you next consider hot work tooling, die blocks or forgings, consider Finkl for the best. The quality of Finkl Hot Work Die Steels is the finest available and costs you less in the long run. Finkl die blocks will make a lasting impression with "impressions that last." Our engineers will gladly offer the advantage of their knowledge and our experience. There is no obligation.

DIE BLOCKS
•
HOT WORK STEEL
•
FORGINGS
•
ELECTRIC FURNACE STEELS

Offices in: DETROIT • CLEVELAND • PITTSBURGH • INDIANAPOLIS
HOUSTON • ALLENTOWN • ST. PAUL • COLORADO SPRINGS
SAN FRANCISCO • SEATTLE • BIRMINGHAM • KANSAS CITY
Warehouses in: CHICAGO • EAST CAMBRIDGE • LOS ANGELES

A. Finkl & Sons Co.

2011 SOUTHPORT AVENUE • CHICAGO 14

PROGRAM

Thursday, Oct. 20—2:00 p.m.

The Powder Metallurgy of Beryllium and Zirconium — Harold Hirsch, Knolls Atomic Power Laboratory, General Electric Company.

Alloy Formation by Powder Metallurgy—Henry A. Saller and Frank A. Rough, Battelle Memorial Institute.

New Methods of Powder Metallurgy for Nuclear Reactor Purposes—William D. Manly, Oak Ridge National Laboratory.

Safe Handling of Pyrophoric and Radioactive Materials—L. R. Kelman, A. B. Shuck and R. C. Goertz, Argonne National Laboratory.

INSTITUTE OF METALS DIVISION—AIME

Sessions at Adelphia Hotel

Monday, Oct. 17—9:00 a.m.

RESEARCH IN PROGRESS

Paul Gordon and B. S. Lement, Chairmen

Abstracts of papers will not be published but will be available in mimeographed form at the registration desk during the meeting.

DEFORMATION (I)

Howard Scott and G. A. Timmons, Chairmen

Internal Friction in Zirconium—W. J. Bratina, Ontario Research Foundation, and W. C. Winegard, University of Toronto.

Creep of Polycrystalline Tin—J. E. Breen and J. Weertman, Naval Research Laboratory.

Interaction of Precipitation, Solid Solution Content and Creep in Magnesium-Aluminum Alloys — C. S. Roberts, Dow Chemical Co.

Tensile Deformation of Germanium Single Crystals — R. P. Carreker, Jr., General Electric Co.

Tensile Deformation of Molybdenum as a Function of Temperature and Strain Rate—R. P. Carreker, Jr., and R. W. Guard, General Electric Co.

Mechanism of Plastic Flow in Titanium at Low and High Temperatures—F. D. Rosi, RCA Laboratories; F. C. Perkins and L. L. Seigle, Sylvania Electric Products, Inc.

(Turn to Page 240)

SEE YOUR NEAREST

OHIO

DISTRIBUTOR

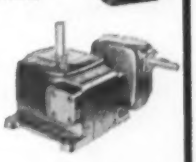
FOR POWER TRANSMISSION

SERVICE

Stock Distributors and Representatives

***Akron 11, Ohio**
Hdwe. & Supply Co.
Atlanta, Georgia
A. Halliday Co., Inc.
Birmingham, Alabama
A. Halliday Co., Inc.
***Buffalo, N. Y.**
*S. H. Pooley
Belting Co.
F. E. Allen Co.
***Chicago, Illinois**
Apex Power Equip. Co.
Schrade-Batterson Co.
***Cincinnati 14, Ohio**
Metzger Machine Co.
***Cleveland, Ohio**
J. A. Shomer Co.
Ohio Gear Co.
***Detroit 3, Michigan**
Abrasive & Supply
Murray Equip. Co., Inc.
***Erie, Pa.**
Cohen-Industrial
Supply
***Grand Rapids 2, Mich.**
F. Raniville Co.
***Hagerstown, Md.**
Hagerstown Equip.
Houston 3, Texas
Behring's Bearing
Service, Inc.
***Indianapolis 2, Indiana**
A. R. Young Co., Inc.
Kalamazoo, Michigan
Bard Steel & Mill
Supply Co.
***N. Kansas City 16, Mo.**
Sesco Engineering &
Supply Corp.
***Los Angeles 1, Calif.**
J. W. Minder Chain
& Gear Co.
***Louisville 2, Kentucky**
Alfred Halliday
***Massillon, Ohio**
Hdwe. & Supply Co.
***Memphis 2, Tennessee**
Memphis Bearing &
Supply Co.
Milwaukee 11, Wisc.
Albert F. Korf Co.
***Minneapolis 4, Minn.**
Ind. Supply Co., Inc.
***New Orleans, La.**
***(Gears)** R. J.
Tricon Co., Inc.
***(Reducers)** Woodward
Wight & Co., Inc.
***New York, N. Y.**
***(Reducers)** Patron
Transmission Co., Inc.
***(Gears)** Atlantic
Trans. & Gear Sales
***Oakland, California**
Adam Hill Co.
***Philadelphia, Pa.**
*Robert L. Latimer Co.
*Rothman Belting &
Equipment Co.
***Piqua, Ohio**
Bornell Supply Co.
***Pittsburgh 30, Pa.**
Standard Machinists
Supply Co.
***Plainville, Conn.**
Abel Trans. Co.
***Portland 14, Oregon**
J. W. Minder Chain
& Gear Co.
***Rochester 14, N. Y.**
H. M. Cross & Son
***Saginaw, Michigan**
Northern Industrial
Supply Co.
***San Francisco 3, Calif.**
Adam Hill Co.
***St. Louis 4, Missouri**
The Essmueller Co.
Syracuse, N. Y.
U. and S. Inc.
***Toledo 12, Ohio**
G. & J. Bearings &
Supply Co.
***Trenton, New Jersey**
Wiley-Hughes Co., Inc.
***Tucson, Arizona**
Tucson Bearing Co., Inc.

IN CANADA, *Montreal, Quebec, John Braidwood & Sons, Ltd. *Stocks carried.



ESTABLISHED 1915

OHIO GEARS

OHIO GEAR CO. • 1366 E. 179th ST. • CLEVELAND 10, OHIO

FREE AIDS

New Technical Literature:

Catalogs and Bulletins

Cold drawn steels

"Quick Facts About Republic Union Cold Drawn Steels," a newly-revised 32-page booklet, summarizes simply and concisely the cold-drawing process, and presents basic information on commercial cold finished products. Summarized are the properties and applications of typical grades of cold-drawn carbon steels, free machining steels, stress-relieved steels, leaded and alloy steels and Enduro Stainless Steel. Shafting, special sections, furnace treatment and carbon correction are discussed in other sections. *Republic Steel Corp.*

For free copy circle No. 1 on postcard, p. 237.

FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 237.

Plastics

Literature describing plastic welding and spraying equipment, large plastic moldings, weldments and component parts for welded fabrications is offered. The condensed booklet details the company's seamless ducting, sheets, rods, bars and blocks of polyethylene, high-temperature high-tensile polyethylene, irradiated polyethylene and unplasticized polyvinyl chloride. Dimensions, thicknesses, inner and outer diams of pipe and tubing and weights of the various stock pieces of all four materials are detailed in charts and tables. *American Agile Corp.*

For free copy circle No. 2 on postcard, p. 237.

Electric fork trucks

Fast, maneuverable electric fork trucks with capacities of 1500, 2000 and 2500 lb are described in a new 6-page bulletin. The illustrated bulletin gives tables of dimensions, capacities, weights, speeds, as well as construction details and pictures of special attachments available. *Baker-Raulang Co.*

For free copy circle No. 3 on postcard, p. 237.

Separation magnets

A 4-page catalog is offered on Super Magnemotive rectangular separation magnets. It gives full details including performance data and is illustrated with halftone cuts, line drawings and schematic and dimensional drawings. *The Ohio Electric Mfg. Co.*

For free copy circle No. 4 on postcard, p. 237.

Precision mechanical spring

The Reliable Story, a 24-page brochure, contains outstanding facts about manufacturing methods, facilities, processes, ranges, and applications of springs in modern manufacturing. It describes methods for specifying correctly and offers suggestions on the selection of spring sources. *The Reliable Spring & Wire Forms Co.*

For free copy circle No. 5 on postcard, p. 237.

STYLE AND SIZES FOR ALL MACHINES ON WHICH THREADS ARE CUT

This die head is unique

THERE IS NO OTHER LIKE IT

It cuts threads with insert chasers. These are, in reality, small sections of the business end of large and expensive chasers, but with this important difference: *their cost is so low they can be even thrown away when dull.* For example, for less than $40 you can get a dozen sets of insert chasers, each set ground ready to go. Change now to insert chaser die heads and watch your performance improve. "SELECTING THE PROPER DIE HEAD FOR THE JOB" sent free on request.

THE EASTERN MACHINE SCREW CORPORATION 21-41 Barclay St., New Haven, Conn.

FREE TECHNICAL LITERATURE

Roller conveyors

A catalog on Series 60 medium and heavy duty roller conveyors has been issued. Twenty pages of data, specifications and illustrations are given. Installation views cover many industries and include roller conveyors combined with overhead cable, live-roller and vertical reciprocating life, belt and other types of conveyors. *E. W. Buschman Co.*

For free copy circle No. 6 on postcard, p. 237.

Deburring machine

Bulletin describes the BMI-15 Burr-Master for production deburring and chamfering of internal gears and splines. Recently added to the line, the machine will handle internal gears and splines from 2- to 20-in. pitch diam, and is available with automation for high-volume production. *Modern Industrial Engineering Co.*

For free copy circle No. 7 on postcard, p. 237.

Vacuum melting

"Vacuum Melted Metals and Alloys," a 23-page technical bulletin, discusses the effects of vacuum melting on properties of various metallic materials, describes benefits of the process to the user of such metals and makes fabricating and machining recommendations. Also included is detailed engineering data on two new vacuum-melted high temperature alloys, M-252 and J-1570, now in commercial production. *Carboloy Dept., General Electric Co.*

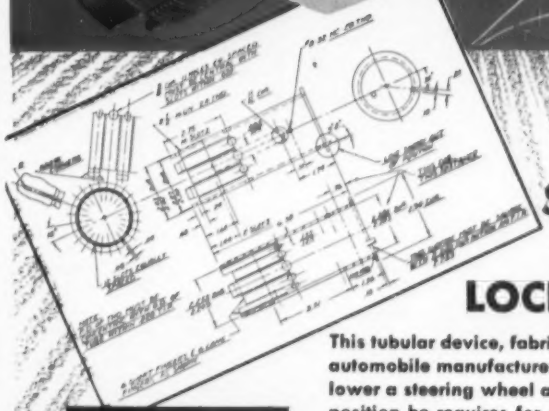
For free copy circle No. 8 on postcard, p. 237.

Titanium

An illustrated booklet gives up-to-date data on the properties of titanium and discusses methods of fabricating the lightweight metal. Included are tables giving mechanical properties of both alloyed and unalloyed grades of the metal and comparative properties of titanium and other pure metals. Methods of forging, annealing, rolling and descaling and pickling titanium sponge in primary fabrication are given, with information on sheet forming, machining, grinding, sawing and joining of titanium in secondary fabrication. *E. I. du Pont de Nemours & Co., Inc.*

For free copy circle No. 9 on postcard, p. 237.

Michigan
Electric Resistance WELDED
STEEL TUBING
Always makes possible Better products at lower Cost



Automotive Steering Wheel HEIGHT LOCKING DEVICE

This tubular device, fabricated by Michigan for a major automobile manufacturer, enables the driver to raise or lower a steering wheel and lock it into the exact elbow position he requires for greatest driving comfort.

A hand nut on the locking sleeve is turned counter-clockwise one-half and locked at the desired height by a one-half clockwise turn.

The utmost dimensional accuracy is required for this intricate part, which requires a multiplicity of exacting operations for smooth, reliable functioning. It is still another example of the ability of Michigan engineers and production workers to meet the needs of product manufacturers for difficult tubing fabrications produced in volume at low cost.

You are invited to check the dimensions in the drawing at the right. It illustrates the type of problems that our engineering staff is always prepared to solve for Michigan customers.

We will welcome the opportunity to place at your disposal the many years of design and production skills that make Michigan tubular products so superior, so dependable, so economical.

ROUND
¼" to 4" O.D. 7 to 22 gauge

SQUARE	Gauge	RECTANGULAR
½" to ¾"	16 thru 22	½" minimum side to 5" maximum side
¾" to 1"	11 thru 22	
1" to 2"	11 thru 20	
2" to 3"	11 thru 14	

Carbon 1010 to 1025

Michigan Tubing

has uniform strength, weight, ductility, I.D. and O.D., wall thickness, machinability, and weldability. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted, and rolled. Available in a wide range of sizes, shapes and wall thicknesses, prefabricated by Michigan or formed and machined in your own plant.

RESISTANCE WELDED STEEL TUBING
THE OLDEST NAME IN ELECTRIC
Michigan **STEEL TUBE** *PRODUCTS CO.*
Nearly 40 Years in the Business
9450 BUFFALO ST. • DETROIT 12, MICH.
FACTORIES: DETROIT, MICHIGAN • SHELBY, OHIO

DISTRIBUTORS: Steel Sales Corp., Chicago, St. Louis, Milwaukee, Indianapolis and Minneapolis—Miller Steel Co., Inc., Hillside, N. J.—Service Steel Div., Van Pelt Corp., Los Angeles, Calif.—Donald A. Harston, Cleveland, Ohio—Globe Supply Co., Denver, Colo.—W. A. McMichaels Co., Upper Darby, Pa.—A. J. Fitzgibbons Co., Buffalo, N. Y.—William P. Hall & Associates, Dayton, Ohio

MECHANICAL SEAMLESS

ELECTRIC-WELDED

AIRCRAFT SEAMLESS

AIRCRAFT MECHANICAL

FABRICATING and FORGING

OSTUCO Tubing Specialists have vast application experience in *your* industry. This storehouse of design and production know-how can improve your product and trim costs too.

OSTUCO's *single-source* service is convenient and error-free. See your nearest OSTUCO Tubing Engineer or write direct for the answer to *your* tubing problem.

OSTUCO TUBING

SEAMLESS AND ELECTRIC WELDED STEEL TUBING
—Fabricating and Forging

OHIO SEAMLESS TUBE DIVISION
of Copperweld Steel Company • **SHELBY, OHIO**
Birthplace of the Seamless Steel Tube Industry in America

SALES OFFICES: BIRMINGHAM • CHARLOTTE • CHICAGO (Oak Park) CLEVELAND • DAYTON • DENVER • DETROIT (Farndale) HOUSTON • LOS ANGELES (Beverly Hills) LOUISVILLE MOLINE • NEW YORK • NORTH KANSAS CITY PHILADELPHIA • PITTSBURGH • RICHMOND • ROCHESTER ST. LOUIS • ST. PAUL • SEATTLE • TULSA • WICHITA

CANADA, RAILWAY & POWER ENGR. CORP., LTD.

EXPORT: COPPERWELD STEEL INTERNATIONAL COMPANY
117 Liberty Street, New York 6, New York

FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on p. 234

Machine feed units

"Automatic Machine Feed Units," an 8-page bulletin, tells how use of automatic material handling equipment with standard machines makes it possible for manufacturers to have continuous production transfer machines, with more flexibility than is usually obtained with large fixed installations. *F. Jos. Lamb Co.*

For free copy circle No. 10 on postcard.

Saw and file tool

A folder on the new Speed-Nu-Matic Saw and File is available. It describes and illustrates 10 important features of the tool and shows typical applications in various manufacturing operations. Various blades offered and their characteristics and applications are shown. *R&G Engineering Co.*

For free copy circle No. 11 on postcard.

Power presses

The complete line of Press-Rite power presses is described in a new bulletin. Models ranging in capacity from 2 to 25 tons are shown, and specifications and features of special interest are given. *Sales Service Machine Tool Co.*

For free copy circle No. 12 on postcard.

Drill chucks

An 8-page booklet describes a newly designed line of drill, reamer and tap chucks, and shows how the 4-slot design increases resistance to pull-out and provides greater protection against tool breakage. Complete size and dimensional information is included. *Scully-Jones & Co.*

For free copy circle No. 13 on postcard.

Spectrophotometry

Two new reports telling how spectrophotometry is solving metals analyses problems are offered. One shows how a spectrophotometer is used to precisely control lead in the making of corrosion-resistant steels, while cutting routine quality-control manpower needs in half. The second tells how a spectrophotometer cut mill products assay time 50 pct, and offered a procedure new technicians could learn in a week. *Beckman Instruments, Inc.*

For free copy circle No. 14 on postcard.

Hole punching units

A comprehensive catalog describes Wales Type CD hole punching units for punching mild sheet metal up to ⅛-in. thick. Each punch assembly and die assembly is independent and self-contained, so that change of setups requires only removal from the press of the pair of operating templates and replacement with the next complete setup. *Wales-Strippit Corp.*

For free copy circle No. 15 on postcard.

Positioners

A bulletin on positioners outlines seven basic points for consideration in the selection of positioners for various operations such as welding, coating, surfacing, chipping and other industrial operations where handling and positioning of work is required. Effective methods in selecting the right positioner to save up to 50% work costs and reduce accident hazards are explained. *Worthington Corp.*

For free copy circle No. 16 on postcard.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **10/6/55**

Circle numbers for Free Technical Literature or Information on New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

If you want more details on products advertised in this issue fill in below:

Page .....Product .....

Page .....Product .....

Page .....Product .....

Your Name .....

Title .....

Company .....

Co. Address .....

City ..... Zone .....

State .....

FIRST CLASS PERMIT No. 36 (Sec. 34.9 P.L.&R.) New York, N. Y.

BUSINESS REPLY CARD
No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE
Post Office Box 77
Village Station
NEW YORK 14, N. Y.

Gear classifiers

Operation and design of 3-way Gear Classifiers are described and illustrated in a new bulletin. Step-by-step action of the machines which automatically monitor oversize, undersize and correct size gears is shown. Also discussed is the 3-Way Classifier Controller and variations of the Classifier which are adapted for continuous belt conveying of wide-face and cluster gears as well as monitoring of gear properties other than oversize and undersize. *Michigan Tool Co.*

For free copy circle No. 17 on postcard.

Hardfacing materials

A handy reference chart and a cutaway template are available as helps to mechanics, welders and master mechanics. The chart gives exact specifications for Caterpillar, International and Allis-Chalmer tractor rollers and idlers and shows how to apply Ranite hard-surfacing materials to all tractor and shovel parts for longest life. The template can be used in measuring wear of caterpillar rails, sprockets, idlers, grousers and rollers. *Rankin Mfg. Co.*

For free copy circle No. 18 on postcard.

Cartridge heaters

"Chromalox Electric Cartridge Heaters" is a 4-page bulletin which illustrates and describes a complete range of electric cartridge units, or spot heaters, for controlled work temperatures to 1000°F. Styles, sizes and outputs illustrated range from 30 to 2000 watts and from $\frac{3}{8}$-in. to $1\frac{1}{4}$ in. in diameter. *Edward L. Wiegand Co.*

For free copy circle No. 19 on postcard.

Recording charts

The methods and controls used in producing recording instrument charts are outlined in a 14-page bulletin. The bulletin shows some of the tests and quality control procedures which go into the manufacture of charts for its own recording and controlling instruments as well as for specialty instruments for other manufacturers. A sample sheet of chart paper is inserted in each bulletin. *The Bristol Co.*

For free copy circle No. 20 on postcard.

Power supply

The Perkin Model G Germanium Rectifier Power Supply for 115 to 125 v, 25 amp continuous operation is described in a new 2-page bulletin. The bulletin outlines advantages of using germanium rectifier power supply units and gives features, specifications and applications of the new unit. Typical applications for heavy duty germanium rectifier power supplies are given. *Perkin Engineering Corp.*

For free copy circle No. 21 on postcard.

Barrel finishing

A compact, completely self-contained barrel finishing department in one unit is described in a new bulletin. The bulletin illustrates and describes features of the "Space Miser" unit, which can be installed in a floor area only 40-in. wide and 26-in. deep. Other advantages and specifications of the unit are given. *Speed-D-Burr Corp.*

For free copy circle No. 22 on postcard.

Cold-drawn tubing

A new brochure describes various applications of cold drawn Electricweld tubing. The informative 4-page folder tells how the product, which has a mirror-like inside finish, is manufactured to close tolerances. Specifications are listed. *Electricweld Tube Div., Jones & Laughlin Steel Corp.*

For free copy circle No. 23 on postcard.

Diamond abrasives

Advantages of diamond abrasive over silicon carbides for rough grinding and in final polishing are featured in a new pamphlet entitled "Metallographic Polishing with Diamond." The booklet has particular application to specimen polishing of metallic carbides and other metals. Information is based on laboratory and field tests. *Elgin National Watch Co., Abrasives Div.*

For free copy circle No. 24 on postcard.

Lithium soap

A new product information bulletin detailing qualities and specifications of its multi-purpose lithium soap industrial greases discusses advantages of multi-purpose grease and gives performance characteristics of Litholine products. *Sinclair Refining Co.*

For free copy circle No. 25 on postcard.

BUSINESS REPLY CARD

No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE

Post Office Box 77

Village Station

NEW YORK 14, N. Y.

FIRST CLASS PERMIT No. 36 (Sec. 34.9 P.L.&R.) New York, N. Y.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **10/6/55**

Circle numbers for Free Technical Literature or Information on New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

If you want more details on products advertised in this issue fill in below:

Page ..... Product .....

Page ..... Product .....

Page ..... Product .....

Your Name .....

Title .....

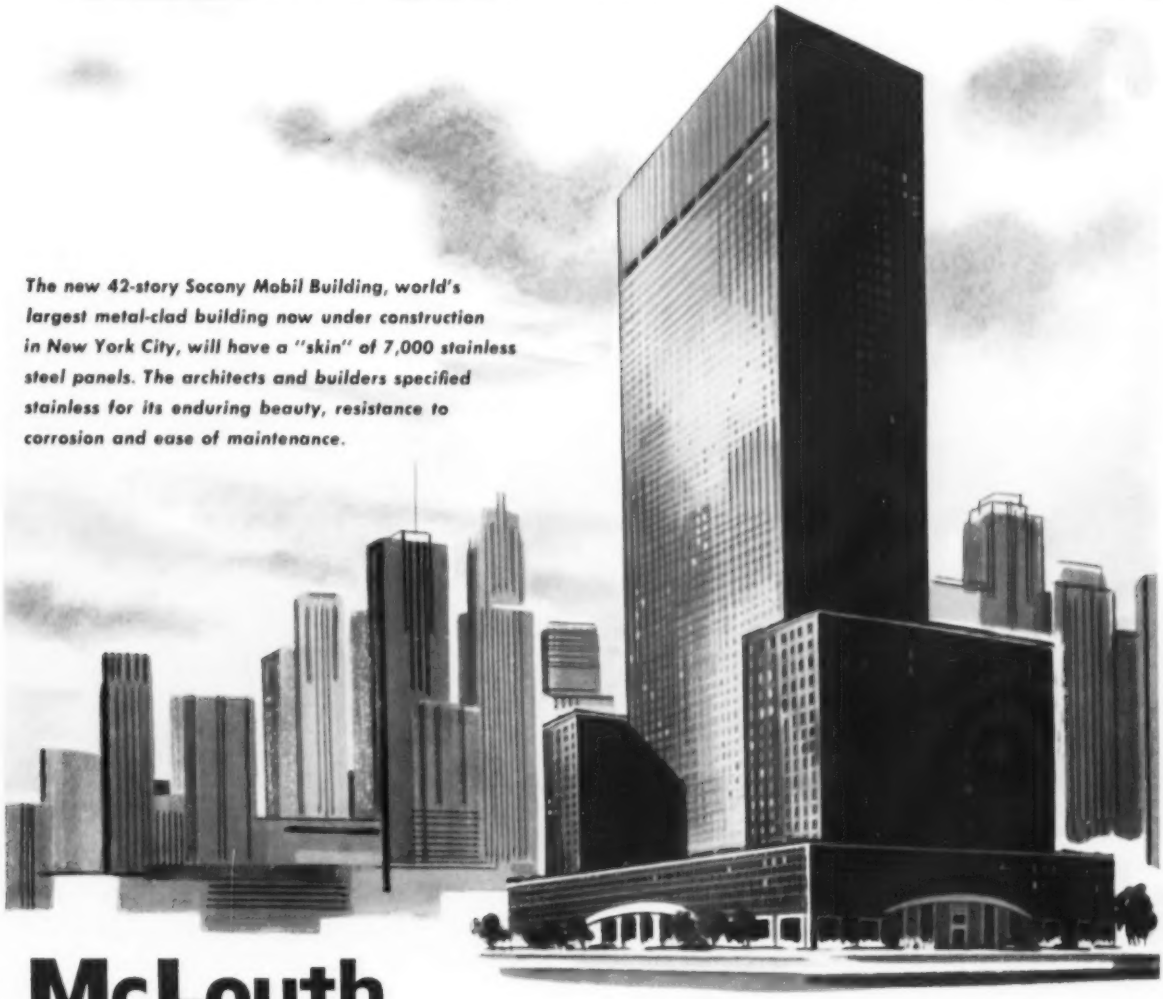
Company .....

Co. Address .....

City ..... Zone .....

State .....

modern design specifies stainless steel

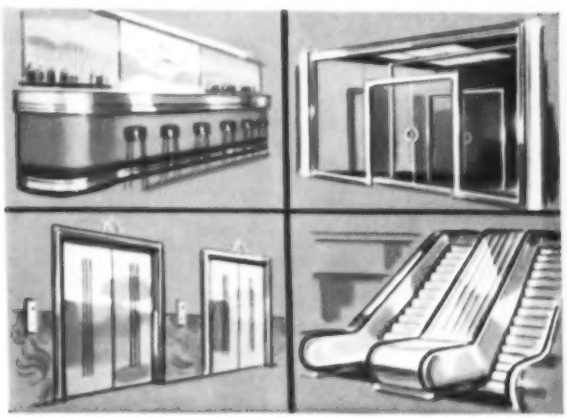


The new 42-story Socony Mobil Building, world's largest metal-clad building now under construction in New York City, will have a "skin" of 7,000 stainless steel panels. The architects and builders specified stainless for its enduring beauty, resistance to corrosion and ease of maintenance.

McLouth
STAINLESS
Steel
for buildings

In fixtures, trim, curtain walls and hundreds of other applications you will profit by using McLouth Stainless Steel.

For the product you make today and the product you plan for tomorrow specify McLouth high quality sheet and strip Stainless Steel.



McLOUTH STEEL CORPORATION

Detroit, Michigan

MANUFACTURERS OF STAINLESS AND CARBON STEELS

MICROHONING* . . . FACTS YOU SHOULD KNOW

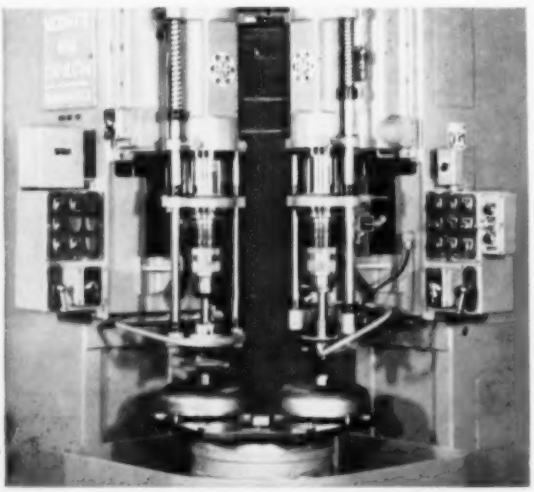
Compare These Microhoning Advantages

- Rapid and efficient stock removal.
- Dimensional accuracy obtained in every part.
- Macrogeometric accuracy—the Microhoning action is not affected by vibration; long abrasive stones generate a true surface.
- Microgeometric accuracy—any desired surface finish and cross-hatch angle duplicated in every part.
- No concentration of heat—the structural surface of the part is undamaged.
- Microhoning applications include tapers, spheres, splines, tandem or interrupted bores, flat surfaces, and any type of material, regardless of hardness (or softness).
- No practical limitation on part length and diameter.
- No chip removal problem—the minute Microhoning chips are flushed away in the coolant and automatically removed.
- Automatic size control.
- Readily adapted to automation.
- Eliminates tool dressing time and cost.
- Location of bores is undisturbed.
- Float principle and low speeds assure minimum maintenance.
- Backed by over 26 years of engineering and service experience.

PRECISION PRODUCTION THROUGH MICROHONING — MICRO MATIC

Microhoning is a low-velocity abrading process that employs thousands of small cutting tips. Because simultaneous and continuous cutting action of tips is spread over a wide area, stock is rapidly removed with a minimum of heating. This abrading technique generates functional surfaces ***by obtaining in one operation the required tolerances, specifications, or condition*** of the surface characteristics.

Included in these characteristics are: dimensional size (the distance between points or faces of a part, e.g., the diameter of a bore); macrogeometry (waves whose crests are more than 1/12" apart); microgeometry (roughness or scratches whose crests are less than 1/12" apart); and surface structure.



Microhoning . . . Example Application

Microhoning both I.D. and O.D. of the hub of a transmission torus cover to generate geometric accuracy and a surface finish of 10 microinches.

O.D.—*2.375", approx. 1" long, blind end*
I.D. —*2.125" x .280" long*
58-60 Rockwell "C"
Stock removal: *.001" to .002"*
Surface finish: *10 microinches*
Production: *180 per hour, gross.*

***MICROHONING = Stock Removal + Geometry + Size Control + Surface Finish**

Movies describing various machining processes and the generation of functional surfaces are available for group meetings. For literature or further information on films, write to:

MICROMATIC HONE CORPORATION

8100 SCHOOLCRAFT AVENUE • DETROIT 38, MICHIGAN

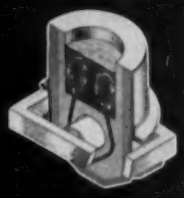
AJAX

ONE NAME...FOUR LEADERS

In Melting, Forging and Heat Treating

When it comes to heating metal, one name—and only one—has the standing of AJAX. Four AJAX associates bear this name and each has originated and developed a basically new furnace for the industry. More new industries, perhaps even your own, have developed from AJAX heating than from any other method of heating since the turn of the century. The combined experience and cooperation of all AJAX engineers justifies your confidence that an AJAX recommendation will be the best for your work.

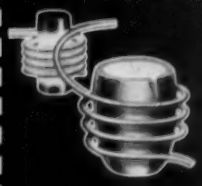
AJAX (WYATT)



AJAX ELECTRIC FURNACE CORP. . . . 1911

AJAX-Wyatt low frequency induction furnaces for melting or superheating cast and malleable iron, and for melting copper base and zinc alloys in the rolling mill and sand casting foundry. Write 1108 Frankford Avenue, Philadelphia 23, Pa.

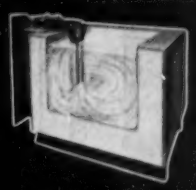
AJAX NORTHRUP



AJAX ELECTROTHERMIC CORP. . . . 1916

AJAX-Northrup high frequency induction melting and heating furnaces using motor generators or spark gap converters for ferrous and non-ferrous metals, including vacuum melting. Also forging, hardening, brazing, carburizing, sintering. Write Trenton 5, New Jersey.

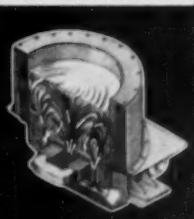
AJAX HULTGREN



AJAX ELECTRIC COMPANY 1931

AJAX-Hultgren electric salt bath heat treating furnaces — internally heated — used for aluminizing, annealing, austempering, brazing, carburizing, cleaning, descaling, hardening, martempering, etc. Write 980 Frankford Ave., Phila. 23, Pa.

AJAX TAMA-WYATT



AJAX ENGINEERING CORP. . . . 1941

AJAX-Tama-Wyatt low frequency induction furnaces for melting, holding, coating, and automatically pouring metals in die-casting, permanent mold, and sand casting foundries — particularly aluminum, zinc, brass, and bronze alloys. Write Trenton 7, New Jersey.

SEE US AT THE METAL SHOW — BOOTH 1619

COMPONENT FABRICATION

by

KIRK AND BLUM

SMALL MILLER PEDESTAL

GUARDS

CARBIDE GRINDER BASE

MACHINE BASE

TIMER CASE

FUEL OIL TANK

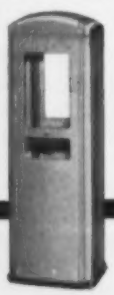
GASOLINE TANK

Put your sheet and plate fabrication problems up to specialists. Whether you require ten or ten thousand components, Kirk & Blum has the men, machines, methods and materials to do the job quickly and economically.

Steel and alloy fabrication . . . sheet, plate and light structural . . . has been a Kirk & Blum specialty for 48 years. Exceptional experience and complete facilities up to 1/2" thickness in carbon steel, stainless, aluminum, monel and other alloys.

Send prints for prompt quotation or write for your copy of the latest Kirk & Blum Sheet and Plate Fabrication catalog. The Kirk & Blum Mfg. Co., 3200 Forrer St., Cincinnati 9, Ohio.

A WIDE RANGE OF SHEET AND PLATE PRODUCTS


GASOLINE PUMP STAMPINGS

HYDRAULIC RESERVOIR

CONDENSATE PUMP TANK

We
Bring Your Prints
To Life.

KIRK AND BLUM

SHEET METAL FABRICATION

PROGRAM

(Continued from p. 233)

Strain Rate Effects in Tungsten—J. H. Bechtold, Westinghouse Electric Corp.

Effects of Oxygen, Nitrogen and Carbon on the Ductility of Cast Molybdenum—L. E. Olds and G. W. P. Rengstorff, Battelle Memorial Institute.

Strain-Induced Porosity and Hydrogen Embrittlement in Zirconium—F. Forscher, Westinghouse Electric Corp.

On the Collapse of Dislocation Loops During Annealing—Jack Washburn, University of California.

Monday, Oct. 17—2:00 p.m.

SEMINAR ON RECRYSTALLIZATION AND GRAIN GROWTH

Bruce Chalmers and J. E. Burke, Chairmen

Temperature Dependence of Annealing Phenomena in a Cold-Rolled Aluminum Single Crystal—A. H. Lutts and P. A. Beck, University of Illinois.

Recrystallization Textures of a Cold-Rolled Aluminum Single Crystal—Y. C. Liu, New York University, and W. R. Hibbard, Jr., General Electric Co.

Primary Recrystallization Textures in Cold-Rolled Silicon-Iron Crystals—C. G. Dunn and P. K. Koh, General Electric Co.

Preferred Orientations in Rolled and Annealed Titanium—J. H. Keeler and A. H. Geisler, General Electric.

Measurement of Grain Growth Rates in Recrystallization—C. D. Graham, Jr., General Electric Co., and R. W. Cahn, University of Birmingham.

Grain Growth Rates and Orientation Relationships in the Recrystallization of Aluminum Single Crystals—C. D. Graham, Jr., General Electric Co., and R. W. Cahn, University of Birmingham, England.

Monday, Oct. 17—2:00 p.m.

SYMPOSIUM ON NUCLEAR METALLURGY

J. H. Frye, Jr., Chairman

D. H. Gurinsky and A. R. Kaufmann, Assistant Chairmen

Plutonium Metal—E. R. Jette, Los Alamos Scientific Laboratory.

Physical Metallurgy of Thorium—H. A. Wilhelm and B. A. Rogers, Iowa State College.

Physical Metallurgy of Uranium—F. G. Foote, Argonne National Lab.

"General's ten factories assure <u>your</u> plants of better container service and lower costs"

Prompt and economical delivery of the containers you order is an important part of the regular service offered by General Box Company. Factories are located in or near the nation's major producing centers. The duplicate production facilities these 10 modern plants contain assure on-time delivery tuned to your needs even under unusual circumstances.

A second important service advantage General Box offers you is access to some of the finest container design and testing facilities in the industry.

Find out the dollars-and-cents advantage to you of this national container service—dependable delivery from the General Box factory near you of containers custom-engineered for your products. Let us send a man to give you the facts. No obligation. Ask, too, for your free copy of the informative booklet, "General Box."

Factories: Cincinnati; Denville, N. J.; East St. Louis; Detroit; Kansas City; Louisville; Sheboygan; Winchendon, Mass.; General Box Company of Mississippi, Meridian, Miss.; Continental Box Company, Inc., Houston.

Engineered Containers for Every Shipping Need

• Wirebound Crates and Boxes • Generalift Pallet Boxes • Corrugated Fiber Boxes • Cleated Corrugated and Watkins-Type Boxes • Stitched Panel Crates • All-bound Boxes

General Box

1829 Miner Street, Des Plaines, Ill.

★ ★ ★ ★ ★

DO YOU BUY DIMENSIONAL GAGES?

If so, don't you believe you should get the most unbiased recommendation from a manufacturer who makes ALL KINDS of modern gages?

When a manufacturer makes only certain types of gages, he naturally recommends these for *all* applications. For instance, a manufacturer who specializes only in Dial Indicating Gages obviously cannot meet every modern gaging requirement. Neither can an Air Gage manufacturer honestly recommend his type of gage for every measuring job. Those who buy the wrong gage can't be blamed if they don't know the facts.

Where, then, can you get an unbiased recommendation? Federal not only makes Dial Indicating Gages and an Air Gage — the Dimensionair, unequalled for jobs when an air gage is required — *BUT Federal makes a complete line of ALL modern gages* including Dial Indicating Gages and Air Gages as well as combinations of various gaging and sorting systems for in-process gaging, machine control, and general automation. *Before* you decide what gages you need, bring your problems to Federal. Our engineers, without bias, will suggest the *best* solution . . . and may save you considerable money. Write or call us today.

AIR-ELECTRIC GAGES

AIR GAGES
All Attachments
Automation
Continuous
Multiple
Special

AUTOMATION GAGES
Employing all gaging systems
Continuous
Inprocess
Machine Control
Sorting

DIAL GAGES
Caliper
Comparators
Depth
Groove
Hole
Snap
Thickness
Thread
Special

DIAL INDICATORS
The only complete line
Long Range
Perpendicular
Super-sensitive
Test Indicators
Test Sets

ELECTRIC-DIAL INDICATOR GAGES

ELECTRONIC GAGES
Automation
Continuous
Multiple
Special
Super Master Comparator

GRINDING GAGES
(Continuous)

INDICATING MICROMETERS

MULTIPLE DIMENSION GAGES

THOUSANDS OF SPECIAL DESIGNS FOR THOUSANDS OF SPECIAL NEEDS

FEDERAL PRODUCTS CORPORATION
Dept. 15-J • Providence 1, Rhode Island

Ask **FEDERAL** *First*

FOR RECOMMENDATIONS IN MODERN GAGES . . .
Dial Indicating, Air, Electric, or Electronic—for Inspecting, Measuring, Sorting, or Automation Gaging

PROGRAM

Monday, Oct. 17—8:00 p.m.

SYMPOSIUM ON NUCLEAR METALLURGY

J. H. Frye, Jr., Chairman
D. H. Gurinsky and A. R. Kaufmann, Assistant Chairmen

Power Reactors — A. M. Weinberg, Oak Ridge National Laboratory.
Problems in Materials for Atomic Power—J. B. Howe, North American Aviation, Inc.

Tuesday, Oct. 18—9:00 a.m.

SEMINAR ON DEFORMATION (II)

Robert Maddin and F. L. Vogel, Jr., Chairmen

Effects of Alloying Elements on Plastic Deformation in Aluminum Single Crystals—E. E. Underwood and L. L. Marsh, Battelle Memorial Institute.
Tensile Creep of High Purity Aluminum—R. W. Guard and W. R. Hibbard, Jr., General Electric Co.
Creep of Copper at Intermediate Temperatures—T. E. Tietz and J. E. Dorn, University of California.
Creep-Rupture by Vacancy Condensation—E. S. Machlin, Columbia University.
Cleavage Steps on Zinc Monocrystals **—Their Origins and Patterns**—J. J. Gilman, General Electric Co.
On the Collapse of Dislocation Loops During Annealing — Jack Washburn, Univ. of California.

Tuesday, Oct. 18—9:00 a.m.

SYMPOSIUM ON TITANIUM

L. Schapiro, Chairman
J. H. Jackson and L. S. Busch, Assistant Chairmen

Keynote Address — Dr. Herbert H. Kellog, Chairman of Titanium Advisory Committee, Office of Defense Mobilization.
Present Status of Titanium Development — D. J. McPherson, Armour Research Foundation.
Panelists—
S. A. Herres, Titanium Metals Corp.
L. S. Busch, Mallory-Sharon Titanium Corp.
V. W. Whitmer, Republic Steel Corp.
D. W. Kaufmann, Rem-Cru Titanium Corp.
Harold Margolin, New York University.
Status of Titanium Fabrication and Use (a Report of the Department of Defense, Titanium Steering Committee)—J. H. Garrett, Office Assistant Secretary of Defense.

"FINEST CHAIN *for* TOUGHEST DRIVES"

WAYNE-INVADER PUMPS RELY ON ATLAS

...for long life under hard service

Invader Rotary Pumps are workhorses for all industries. That's why the Schirmer Division of the Wayne Pump Company equips all chain-drive pumps, like the oil refining unit above, with Atlas Roller Chain and Precision-Matched Sprockets. They say Atlas is the finest chain for the toughest drives.

Long life starts with Atlas specially selected steels. Plates, pins, and bushings are super-toughened by heat-treating and the "Ni-Carb" process which give a stronger, better operating chain over longer periods. Rollers, pins and bushings are "Micro-Finished" to exact tolerances. Sprockets heat treated for toughness are precision-ground for smooth, quiet operation with Atlas Chain.

Atlas Chain and Atlas Sprockets are carefully pre-tested at more than 30 points in production to assure you of chain unsurpassed in quality and performance. Whatever your chain or sprocket need call on Atlas. Write for Atlas Chain and Sprocket Handbook ARC-54.

ATLAS CHAIN & MANUFACTURING COMPANY
DOYLESTOWN, PA.

ATLAS

ROLLER CHAIN AND SPROCKETS

WALLINGFORD

Dots the i in Quality

STAINLESS STEEL STRIP

• THINNESSES TO .002" • ACCURACY TO ±.0001"

THE EFFORT TO MAKE THE QUALITY OF WALLINGFORD STAINLESS STEEL STRIP AS HIGH AS POSSIBLE NEVER STOPS SHORT OF ITS GOAL.

Result: Wallingford Stainless Strip has the *external* qualities — uniformity, finish, straight, smooth edges — and *internal* qualities — analysis, temper, heat and corrosion resistance — that assure an improved product, reduced fabricating and finishing costs, fewer rejects and less down-time.

Visit Wallingford to meet the men, see the machines and atomic and electronic control devices that make Wallingford Stainless Steel Strip, Tubing and Pipe . . . the *finest*.

THE
WALLINGFORD
SINCE 1922
STEEL CO.
WALLINGFORD, CONN., U.S.A.

STAINLESS • ALLOY • HIGH CARBON • LOW CARBON • STRIP
STAINLESS WELDED TUBES AND PIPE

Panelists—

Lt.-Col. L. W. Herway, United States Air Force.
J. J. Harwood, Office of Naval Research.
N. L. Reed, Watertown Arsenal.
C. B. Voldrich, Battelle Memorial Institute.

Tuesday, Oct. 18—2:00 p.m.

SYMPOSIUM ON TITANIUM

L. Shapiro, Chairman

J. H. Jackson and L. S. Busch, Assistant Chairmen

The Background for Practical Heat Treatment of Various Titanium Alloy Types—P. D. Frost, Battelle Memorial Institute.

Panelists—

W. L. Finlay, Rem-Cru Titanium Corp.
B. Morelander, North American Aviation.
S. Abkowitz, Watertown Arsenal.
William Rostoker, Armour Research Foundation.
H. J. Middendorp, Materials Laboratories, Wright-Patterson Air Force Base.

Future Use Pattern for Titanium—Colonel B. S. Mesick, Retired, Arthur D. Little, Inc.

Panelists—

L. Shapiro, Douglas Aircraft Corp.
C. W. Alesh, Consolidated Vultee Aircraft Corp.
R. Thielemann, Pratt and Whitney Aircraft Corp.
V. Kudryk, Chemical Construction Co.

"Congratulations, Fred, I heard you've just been made the new efficiency expert."

Tuesday, Oct. 18—2:00 p.m.

DIFFUSION AND RELATED PHENOMENA

C. E. Birchenall and A. S. Nowick, Chairmen

Diffusion of Nitrogen in Iron—P. E. Busby and Cyril Wells, Carnegie Institute of Technology, and D. P. Hart, Pittsburgh Plate Glass Co.

Diffusion in Liquid Lead—S. J. Rothman, Argonne National Laboratory; L. D. Hall, Stamford Research Institute.

Self-Diffusion in Solid Nickel—R. E. Hoffman, F. W. Pikus, and R. A. Ward, General Electric Co.

Diffusion and Marker Movements in Beta Brass—U. S. Landergren, SKF Industries, Inc.; C. E. Birchenall, Princeton University, and R. F. Mehl, Carnegie Institute of Technology.

Self-Diffusion in Single and Polycrystals of Zinc at Low Temperatures—F. E. Jaumot, Jr., and R. L. Smith, Franklin Institute.

Some Studies of Al-Cu and Al-Zr Solid State Bonding—Samuel Storcheim, Sylvania Electric Products, Inc.

On the Rate of Sintering — Gerhard Bockstiegel, Sintermetallwerk Krebsoge Smett, Germany.

Temperature Gradient Zone Melting —W. G. Pfann, Bell Telephone Laboratories, Inc.

Thermodynamic Properties of Solid Iron-Gold Alloys—L. L. Seigle, Sylvania Electric Products, Inc.

A Search for Oxidation-Resistant Alloys of Molybdenum — G. W. P. Rengstorff, Battelle Memorial Institute.

Wednesday, Oct. 19—9:00 a.m.

CONSTITUTION AND GENERAL METALLURGY

D. J. Blickwede and David Swan, Chairmen

Titanium-Rich Corner of the Ti-Al-V System—J. J. Rausch and F. A. Crossley, Armour Research Foundation, and H. D. Kessler, Titanium Metals Corp. of America.

Titanium-Molybdenum-Oxygen System—P. A. Farrar, L. P. Stone, and Harold Margolin, New York University.

Thorium-Columbium and Thorium-Titanium Alloy Systems — O. N. Carlson, J. M. Dickerson, H. E. Lunt, and H. A. Wilhelm, Iowa State College.

System Zirconium-Nitrogen — R. F. Domagala, D. J. McPherson, and M. Hansen, Armour Research Foundation.

Fabrication of Powdered Thorium— W. W. Beaver, K. G. Wikle, and J. G. Klein, Brush Beryllium Co.

Metallographic Identification of Nonmetallic Inclusions in Uranium—R. F. Dickerson, A. F. Gerds, and D. A. Vaughan, Battelle Memorial Institute.

For further information, write 150 Canal Street

CLARK BROS BOLT CO.
MILLDALE CONN.

for the bearing that meets your individual need

Phone your Bunting Distributor before you start an endless search or commence costly machining of an unusual bearing. It is often easy to alter a Bunting Standard Stock Bearing to fit extraordinary applications. Also services of expert Service Machine Shops maintained in Bunting Branches are instantly available through your Bunting Distributor.

Bearing Headquarters

Your Bunting Distributor carries in stock for your money saving convenience completely machined and finished Bunting Standard Stock Industrial Bearings, Electric Motor Bearings and Precision Bronze Bars in a complete range of sizes, meeting all your usual production and maintenance needs. You will find him listed in the classified section of your telephone book—most likely under the heading Bars, Bronze or Bearings, Bronze. Your Bunting Distributor is an industrial distributor or a specialist in certain industrial items. He has been especially selected for his responsibility and his understanding of bearing requirements. Ask him for the Bunting Catalog or write.

Bunting®

BRONZE BEARINGS • BUSHINGS • PRECISION BRONZE BARS

THE BUNTING BRASS AND BRONZE COMPANY, TOLEDO 1, OHIO
BRANCHES IN PRINCIPAL CITIES

Wednesday, Oct. 19—9:00 a.m.

JOINT SYMPOSIUM ON HIGH-TEMPERATURE ALLOYS

Institute of Metals Division of AIME and Metals Engineering Division of ASME

W. R. Hibbard, Jr., Institute of Metals Division AIME, and J. J. B. Rutherford, Metals Engineering Division ASME, Chairmen

MATERIALS FOR USE UP TO 1250°F

Alloy Design of Material up to 1250°F—J. W. Freeman, University of Michigan.

Stability of Alloy Steels — A. B. Wilder, National Tube Division, U. S. Steel Corp.

Some Practical Aspects of High-Temperature Design Below 1250°F—E. C. Chapman, Combustion Engineering, Inc.

Wednesday, Oct. 19—2:00 p.m.

JOINT SYMPOSIUM ON HIGH-TEMPERATURE ALLOYS

Institute of Metals Division of AIME and Metals Engineering Division of ASME

W. R. Hibbard, Jr., Institute of Metals Division AIME and J. J. B. Rutherford, Metals Engineering Division ASME, Chairmen

MATERIALS FOR USE ABOVE 1250°F

Principles of Design and Development of Alloys for Use Above 1250°F—N. J. Grant, Massachusetts Institute of Technology.

Some Practical Aspects of Design Above 1250°F—A. W. F. Green, General Motors Corp.

Wednesday, Oct. 19—2:00 p.m.

PHASE TRANSFORMATIONS

M. E. Nicholson and W. G. Pfann, Chairmen

High-Speed Quenching Dilatometer—F. E. Martin and R. H. Raring, Naval Research Laboratory.

Heat Treatment and Mechanical Properties of Titanium-Iron Alloys—F. C. Holden, H. R. Ogden and R. I. Jaffee, Battelle Memorial Institute.

Effect of Carbon on Some Properties of Ti-Mo Alloys—D. W. Levinson, W. Rostoker, and A. Yamamoto, Armour Research Foundation.

Hardenability of Titanium Alloys Calculated from Composition—A Preliminary Examination: L. D. Jaffee, California Institute of Technology.

PROGRAM

Preliminary Examination of the Quenching of Titanium Alloys—L. D. Jaffee, California Institute of Technology.

Sigma Nucleation Times in Stainless Steels—G. F. Tisinai, J. K. Stanley, and C. H. Samans, Standard Oil Co. (Indiana).

Evidence for Solidification of a Metastable Phase in Fe-Ni Alloys — R. E. Cech, General Electric Co.

Heterogeneous Nucleation of the Martensite Transformation—R. E. Cech, General Electric Co.

Effects of Alloying Elements on the Electrical Properties of Manganin Type Alloys—D. D. Pollock and D. I. Finch, Leeds and Northrup Co.

475° C Embrittlement of Chromized Coatings on Low Carbon Steel—W. L. Chu, General Electric Co.

AMERICAN WELDING SOCIETY

Bellevue-Stratford Hotel

Mon. Afternoon, Oct. 17

Three Simultaneous Sessions

CO_2 GAS SHIELDED WELDING

Carbon-Dioxide Shielded-Metal Arc-Welding Process—Robert J. Keller and John P. Koss, A. O. Smith Corp.

Moisture and Its Effects in Carbon Dioxide Welding of Steel—Roger W. Tuthill, General Electric Co.

Electrode Characteristics for Welding Mild Steel in Atmospheres of Carbon Dioxide by the Consumable-Electrode Gas-Shielded Welding Process — Robert D. Mann and Julian D. Carey, General Electric Co.

RESISTANCE WELDING

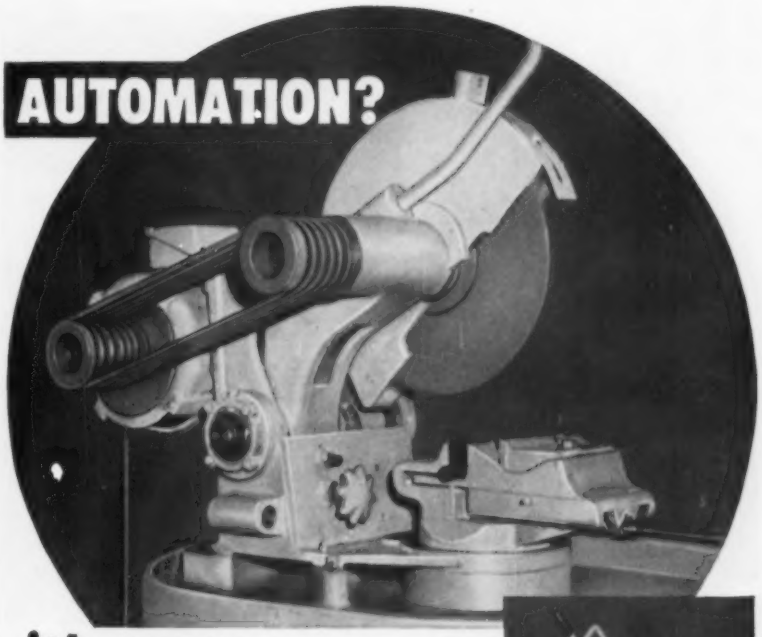
The Behavior of Spot-Weld Cross-Section During Loading—John F. Rudy, Wright Air Development Center, Roy B. McCauley and Robert S. Green, Ohio State University.

Seam Welding Dissimilar Thicknesses of Low-Carbon Steel—M. L. Begeman and Ernest J. Funk, University of Texas.

Resistance Spot-Welding Schedules for Welding Projection Hardware to Mild Steel Sheet and Plate—O. K. Barnes, Westinghouse Electric Corp.

WELDABILITY AND RESEARCH

Effect of Preheating on Stress-Corrosion Cracking of Steel Weldments —E. Paul DeGarmo and I. Cornet, University of California.



it's yours

TO ANY DEGREE WHEN YOU *specify* THIS MODEL 48-W BRIDGEPORT ABRASIVE CUT-OFF MACHINE

Here's why . . .

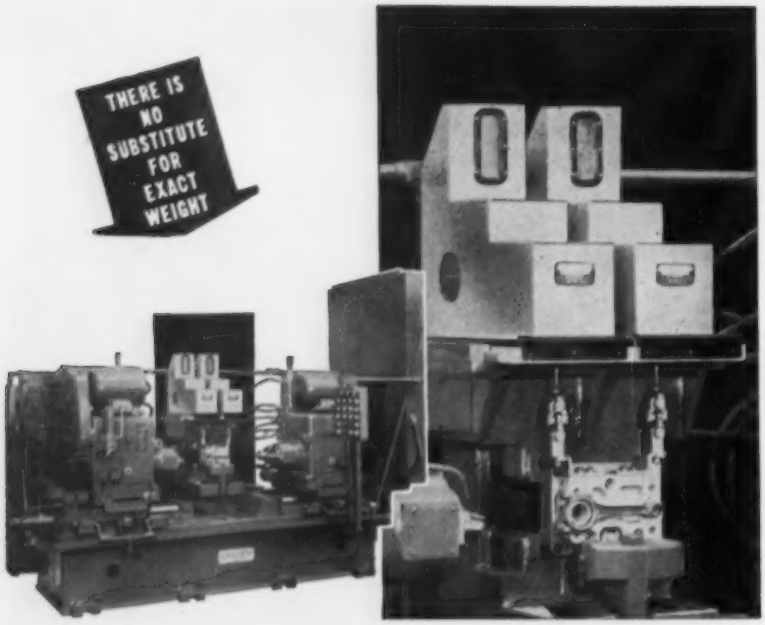
- Air cylinder and hydro-check actuates head . . . saves labor and reduces wheel costs. (16" dia. wheel).
- Vise operates by air cylinder . . . integrated head, vise operation is excellent safety feature.
- Feeding mechanism which grips material to be cut, moves it into position.
- A series of micro switches tie above operations into smooth cycle which repeats automatically.
- Stainless steel spindle with Grease Sealed bearings.
- Coolant applied equally to both sides of cut.
- Vise holds *both* ends of piece being cut.
- Abundant power supplied by 7½ H.P. motor.
- Swivel head for accurate angle cutting.
- Accurate counterbalance of head by location of motor.
- Heavyweight for long life and efficient operation.
- *Complete automation* produces close tolerances, increases production, saves labor.

LOBDELL has a *complete line* of BRIDGEPORT Cut-Off Machines to suit every need. *Write for further details.*

LOBDELL DIVISION

UNITED ENGINEERING AND FOUNDRY COMPANY

WILMINGTON 99, DELAWARE



Another METAL WORKING problem solved with EXACT WEIGHT SCALES

Here Exact Weight SHADOGRAPH Scales are helping the automotive industry obtain better balance for connecting rods through more accurate control of the milling operation. A pair of Exact Weight scales weigh both ends of rod and electronically transmit signals to set this Snyder Milling Machine. Balancing is accomplished in one pass milling and conforms to tolerance of 1.16 oz. (1.7 grams).

Practically every product encounters a weight problem in manufacture or processing. Whether it's balancing, weighing castings or checkweighing machined parts, Exact Weight scales are helping attain greater precision. In operations like the above, they are bringing manufacturing processes a step nearer automation.

Let us tell you more about Exact Weight precision scales and their place in the metal working industry. Write or phone our nearby sales representative—check your yellow pages.

Sales and Service Coast to Coast

Exact Weight Scales

Better quality control
Better cost control

THE EXACT WEIGHT SCALE COMPANY

935 W. Fifth Avenue, Columbus 8, Ohio
In Canada: P. O. Box 179, Station S, Toronto 18, Ont.

Heat Treatment of Air Hardening Alloys on Welding — John J. B. Rutherford and John F. Ewing, Babcock & Wilcox Co.

The Development of High-Tensile High-Impact Electrodes — G. S. Wepfer, A. O. Smith Corp.

Tues. Morning, Oct 18

Three Simultaneous Sessions

WELDABILITY AND RESEARCH

Further Studies of the Hot Ductility of High Temperature Alloys — Ernest F. Nippes and Warren F. Savage, Rensselaer Polytechnic Institute.

Influence of Lattice Structure Upon Strength Ductility-Temperature Relationships — Julius Reuschkel, Westinghouse Electric Corp.

A Welding Test for Gray and Nodular Cast Iron—A. L. Schaeffler and W. A. Schumbacker, Allis-Chalmers Manufacturing Co.

STRUCTURES

Fatigue Strength of Welds in Low-Alloy Structural Steels—G. E. Nordmark, W. H. Munse, J. E. Stallmeyer and N. M. Newmark, University of Illinois.

Welding of Structural Steel for Hartford Library — Carl L. Kreidler, Lehigh Structural Steel Co.

Fabrication of Crosshead Beams for the World's Largest Hydraulic Press—V. M. Nigriny, The Midvale Co.

INSPECTION AND TESTING

Backing Ring Elimination Permits Ultrasonic Testing and Avoids Cracking of Piping Welds—Wilfred A. Pollock, Wisconsin Electric Power Co.

The Gamma Radiographic Control of Welded Transmission Pipe Lines—Colin M. C. Bates, Welding Supervision Ltd.

Radiography in the Jungles of Sumatra, Indonesia—Walter W. Offner, X-ray Engineering Co.

Tues. Afternoon, Oct. 18

Three Simultaneous Sessions

WELDABILITY AND RESEARCH

The Effect of Microstructure on Notch Toughness and Fracture Morphology—Part II—Joseph C. Danko,

PROGRAM

John H. Gross and Robert D. Stout, Lehigh University.

Crack Arresting by Overlays of Notch Tough Weld Metal—P. P. Puzak and W. S. Pellini, Naval Research Laboratory.

Final Report on Brittle Fracture Studies—M. S. Northup and F. J. Feely, Jr., Esso Research & Eng. Co.

SHIPBUILDING

Offshore Drilling Barges—Robert H. Macy, The Ingalls Shipbuilding Corp.

Building an All-Welded 96-Ft Twin-Screw Yacht—LaMotte Grover, Air Reduction Co., and E. H. Holder, Ingalls Shipbuilding Corp.

Stress Studies of Various Shaped Welded Doublers in Hatch Corner—Yoshio Akita, Transportation Technical Research Institute of Japan; H. Kihara, University of Tokyo, N. Ando, Transport Technical Research Institute, and K. Yoshimoto, Ishikawajima Heavy Industry Co.

WELDING EQUIPMENT

Characteristics of a Rectifier Type Constant Voltage Power Supply—Jesse W. Pomazal, Harnischfeger Corp.

Transient Problems When Using Hypersil Transformers in Welding Applications—Robert C. Mierendorf, Square D Co.

Power Sources for Inert-Gas-Shielded Consumable Electrode Welding—A. Lesnewich and Everett Cushman, Air Reduction Co., Inc.

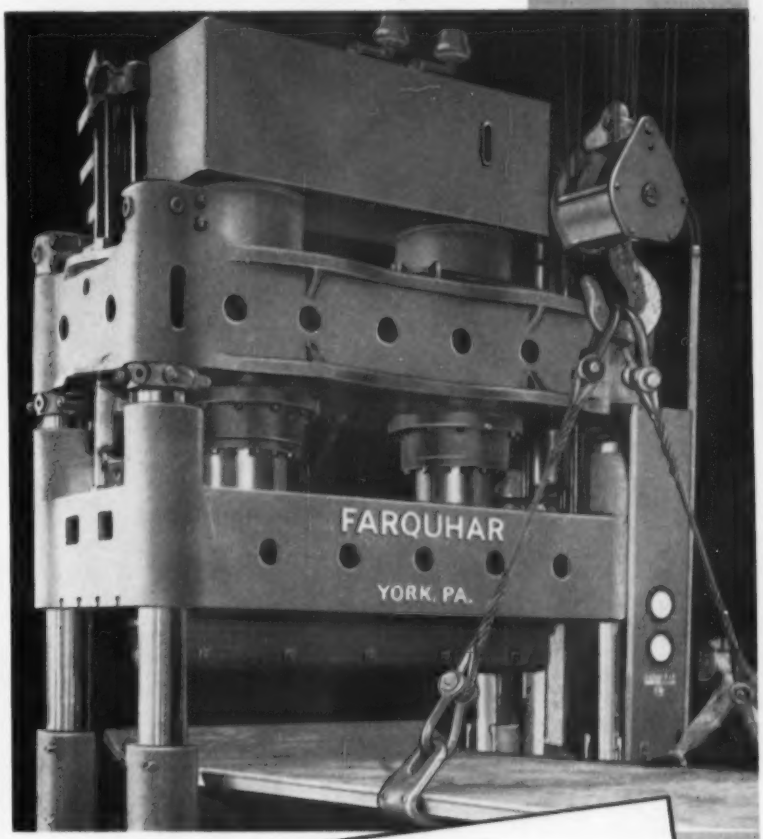
"The only trouble with this space-saving layout is we haven't got the space for it."

Farquhar

HYDRAULIC PRESSES

Form Heavy Steel Plates Accurately

1000 TON FOUR COLUMN PRESS



. . . easily and quickly

With easy to operate Servo Controls, speed and pressure respond instantly to touch. Large open work areas make it simple to perform a wide variety of plate forming work. Hydraulic systems completely self-contained with filters and coolers. Farquhar Presses are backed by over 50 years of experience manufacturing all types of heavy presses.

Write for Farquhar's Bulletin HP-49.

THE OLIVER CORPORATION — Farquhar

A. B. FARQUHAR DIVISION

THE OLIVER CORPORATION, 1503 Duke St., York, Pa.

MORE WORK . . . FASTER!
WITH ERIE STRAYER
HOOK-ON CLAMSHELLS

CHECK these exclusive features:

- √ EASY HOOK-ON—no changeover problem. Versatile.
- √ COMPACT, RUGGED DESIGN—longer, tougher service.
- √ LIMITED HEADROOM REQUIREMENT—made for tight spots.
- √ ALWAYS UNDER PERFECT CONTROL—eliminates shock.
- √ ¼ TO 10 YARD CAPACITY—models to suit your needs.

THE FAMOUS **STRAYER ELECTRIC** BUCKET
ALSO AVAILABLE FOR AC OR DC OPERATION

For Catalogs and General Information, Write:

ERIE STRAYER CO.
GEIST ROAD • ERIE, PENNSYLVANIA

Wed. Morning, Oct. 19

Three Simultaneous Sessions

STAINLESS STEELS

Mechanical Properties of Modified Type 347 Weld Deposits—Lorin K. Poole and R. David Thomas, Jr., Arcos Corp.

Hot Cracking of Stainless Steel Weldments—P. P. Puzak and W. S. Pellini, Naval Research Laboratory.

Permeability and Crack Sensitivity of Stainless Welds—John L. Lang and Charles Wright, Jr., Lukens Steel Co.

WELDING ELECTRODES

Metal Powder Electrodes and Their Applications—E. DiLiberti, Air Reduction Sales Co.

Properties and Applications of Low-Hydrogen Iron Powder Electrodes—D. C. Smith, W. G. Rinehart and D. C. Helton, Harnischfeger Corp.

Effect of Individual Coating Ingredients on Surface Tension of Iron Electrodes—Thomas H. Hazlett and Earl R. Parker, University of California.

APPLICATIONS

Selection of Proper Inert-Gas-Shielded Arc-Welding Process — J. Warden Cunningham and Harry A. Huff, Jr., Air Reduction Sales Co.

High-Speed Welding of Steel Compressor Cases—C. F. Stephenson, York Grantly Division of York Corp., and Robert A. Stone, Air Reduction Sales Co.

New Surfacing Techniques — K. H. Koopman and R. S. Zuchowski, Linde Air Products Co.

Wed. Afternoon, Oct. 19

Three Simultaneous Sessions

TITANIUM & MOLYBDENUM

Welding of Titanium—E. F. Gorman, Linde Air Products Co.

Resistance Welding Ductile Joints in Commercially Pure Titanium—Robert Wickham, Marquardt Aircraft Co.

Effects of Oxygen on Soundness and Ductility of Molybdenum Welds—W. N. Platte, Westinghouse Electric Corp.

PROGRAM

WELDING ELECTRODES

A New Approach to Welding of Alloy Steels With Alloy Fluxes—Emmett Smith and Paul Jerabek, The Lincoln Electric Co.

Effect of Aluminum Additions to Mild Steel Weld Metal—Craig R. Sibley, Air Reduction Co., Inc.

Effect of Current and Atmospheres on Arc Temperatures—George M. Gordon, Olga A. Cotter and Earl R. Parker, University of California.

PRESSURE VESSELS

Performance of High-Strength Pressure Vessel Steels—J. H. Gross and R. D. Stout, Lehigh University.

Resistance of Low-Alloy Steel Plates to Biaxial Fatigue—C. E. Bowman and T. J. Dolan, University of Illinois.

The Practical Approach to the Welding of Stainless Steel Pressure Vessels—Frederick H. Clash, Jr., Link-Belt Co.

Thurs. Morning, Oct. 20

Three Simultaneous Sessions

ALUMINUM

Inert Shielding Gases for Welding Aluminum—James D. Dowd, Aluminum Company of America.

Hydrogen vs. Acetylene vs. Inert Gas in Welding Aluminum Alloys—J. Koziarski, Piasecki Helicopter Corp.

Welding Aluminum to Copper Using Inert-Gas Metal-Arc Process—L. A. Cook and M. F. Stavish, Kaiser Aluminum & Chemical Corp.

PIPING AND PRESSURE VESSELS

Welding of High-Temperature High-Pressure Piping with Chrome-Moly Electrodes—Lloyd C. Nesbitt, Metal & Thermit Corp.

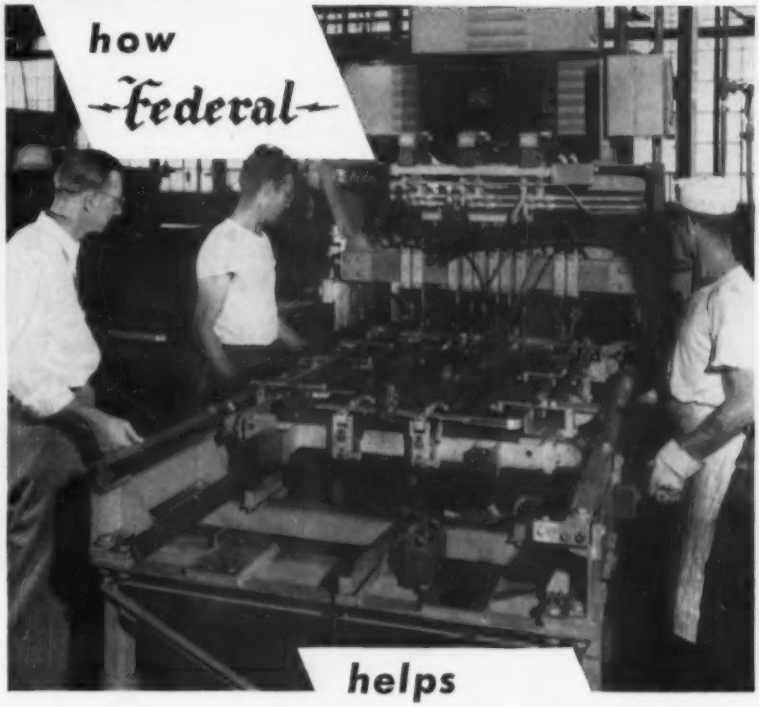
The Application of Inert-Gas Tungsten-Arc Welding to Carbon Steel Pipe—F. J. Pilia and R. W. Minga, Linde Air Products Co.

Welding Pressure Vessels with Automatic Submerged Arc—Wilmer W. Weber, The Pfaudler Co.

APPLICATIONS

Automation of Metal Manufacturing Requires Correct Use of Arc Welding—H. O. Klinke, The Taylor-Winfield Corp.

here's how -Federal-



helps Remington Rand make better office equipment

Now, a single operator using a special FEDERAL Multi-Spot Welder can readily meet Remington Rand's high production requirements on their desk top assemblies.

The desk top frame and reinforcing channel are spot welded to the flat sheet top in eighty places, using series welding principles with a minimum of marking on the show surfaces.

Parts are loaded and clamped on the welder die table which is anti-friction mounted on "V" guide ways and automatically indexed under the welding bridge.

Simple and flexible design features permit variable spot spacing in both directions. Pre-selected spot patterns and firing sequences, and readily adjustable part locators and clamps, make for a multi-purpose machine.

If you want the increased production possible with resistance welding equipment, but feel that the operation doesn't merit a single purpose machine, why not look into the possibilities of Federal Multi-purpose welders that can be designed to meet the requirements of several operations. Contact the Federal representative nearest you, or write direct for full information.

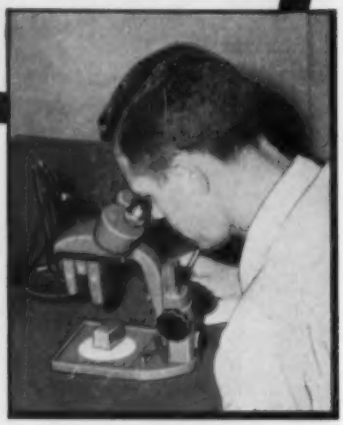
-Federal- WELDERS

Warco PRESSES

The Federal Machine and Welder Company
Warren, Ohio

RESEARCH AT WORK FOR YOU

CHIEF SANDUSKY



FERROUS AND NON-FERROUS CENTRIFUGALLY CAST ROLLS, SLEEVES, TUBES, LINERS, CHUTES, RETORTS, RINGS, BUSHINGS, BEARINGS, ETC.

Many concerns are discovering strong, uniform, closely grained Sandusky centrifugal castings are essential to applications requiring maximum strength and extreme resistance to heat, corrosion, and abrasion. Chief Sandusky continuous research is ever expanding the range of these uses.

This versatility and quality results from constant research and testing in our modern firm and independent laboratories. Vast foundry and field experience also assists in supplying the proper castings for you.

Excellent machining facilities for drilling, turning and boring are available.

Call or write Sandusky, the leading source of ferrous and non-ferrous centrifugal castings. ALWAYS SPECIFY CHIEF SANDUSKY.

C. M. Lovsted & Co., Seattle, Wash. • Tynes Bros., Birmingham, Ala. • Cordes Bros., San Francisco and Wilmington, Calif.

Chief SANDUSKY CENTRIFUGAL CASTINGS

FERROUS AND NON-FERROUS

SANDUSKY FOUNDRY AND MACHINE CO., Sandusky, Ohio

How to Apply Automatic Submerged Arc Welding—Robert Wilson, The Lincoln Electric Co.

Lower Part Cost by Projection Welding—C. H. Burgston, Deere & Co.

Fri. Morning, Oct. 21

Three Simultaneous Sessions

BRAZING

Wettability of Steel with Pure Silver and Silver Brazing Alloys—Nikolajs Bredzs, Armour Research Foundation of Illinois Institute of Technology.

Physical Properties of Butt Joints Brazed with BCu, BAg-1, and BAg-3 Filler Metals—Grant Hansel, Jr., Materials & Processes Laboratory, General Electric Co.

Automatic Blade of High Solidity Axial Flow Fans—John B. Hill, Jr., Sawyer-Bailey Corp.

MAINTENANCE & CUTTING

Effective Welding Circuit Maintenance—Donald L. Caldwell, Caterpillar Tractor Co.

Contour Beveling with the Electronic Tracer—Howard B. Cary, Marion Power Shovel Co., and R. F. Helmkamp, Air Reduction Sales Co.

APPLICATIONS

How to Use Steel Effectively in Machinery—Omer Blodgett, The Lincoln Electric Co.

An Application of the Pressure Welding Process to Fabricate Continuous Rail—D. C. Hastings, Richmond, Fredericksburg and Potomac Railroad Co.

Manual Arc Welding of Butt Joints in Crane Rails—Ivan Kutuchief, A. O. Smith Corp.

SOCIETY FOR NONDESTRUCTIVE TESTING

Sessions at Hotel Sylvania

Monday, Oct. 17—9:00 a.m.

EDUCATIONAL SURVEY

Chairman—Samuel A. Wenk, Battelle Memorial Institute, Columbus, Ohio.

Co-Chairman—Frank Catlin, Magnaflux Corporation, Chicago, Illinois.

Orientation Lecture—Dr. Robert C. McMaster, Ohio State University, Columbus, Ohio.

PROGRAM

Sources of Defects Located by Nondestructive Testing—Carl E. Betz, Magnaflux Corporation, Chicago, Illinois.

Radiography—Royal G. Tobey, Eastman Kodak Company, Rochester, New York.

Magnetic Particle Inspection—W. E. Thomas, Magnaflux Corporation, Chicago, Illinois.

Monday, Oct. 17—1:30 p.m.

Penetrant and Eddy Current Testing—Hamilton Migel, Magnaflux Corporation, Chicago, Illinois.

Ultrasonic Inspection—

Reflection Testing—John C. Smak, Sperry Products, Inc., Danbury, Connecticut.

Resonance Testing—Peter K. Bloch, Branson Instrument Co., Stamford, Connecticut.

Immersion Testing—J. B. Morgan, Aluminum Company of America, New Kensington, Pennsylvania.

Evaluation of Indications of Discontinuities—James H. Bly, X-Ray, Inc., Detroit, Michigan.

Question Period.

Tuesday, Oct. 18—9:00 a.m.

PRODUCTION TESTING

Chairman—Richard F. Holste, General Electric Company, Milwaukee, Wisconsin.

Co-Chairman—Charles Tucker, Aluminum Company of America, Cleveland, Ohio.

A High-Powered Industrial Fluoroscopic Tube—Donald T. O'Connor, Machlett Laboratories, Inc., Springdale, Connecticut.

Three Electronic Measurement Methods for Metallurgy—Dr. Friedrich Foerster, Institute Dr. Foerster, Reutlingen, Germany.

Eddy Current Inspection in Aircraft Production Applications—Richard Hochschild, University of California, Berkeley, California.

Field and Laboratory Stress Analysis of Locomotive Components—Ludvig Petersen, Electro-Motive Division, GMC, La Grange, Illinois.

Tuesday, Oct. 18—2:00 p.m.

AIRCRAFT INSPECTION

Chairman—John E. Rutledge, McDonnell Aircraft Corporation, St. Louis, Missouri.

FIRST CALL FOR QUALITY

P AND A serves you the best in brass

With Plume and Atwood's special P"A brass, you can improve your product and save money, too. It's made by a special process to give it a finer grain, a harder surface and a brighter lustre that means a better product with added customer appeal. Its superior quality costs no more and can save you up to 50% on finishing costs. Send us samples of your present brass parts. Our engineering staff is at your service.

- Brass, Commercial Bronze, Phosphor Bronze, Nickel Silver in Sheet, Strip, Mill Coils or Cut to Length.

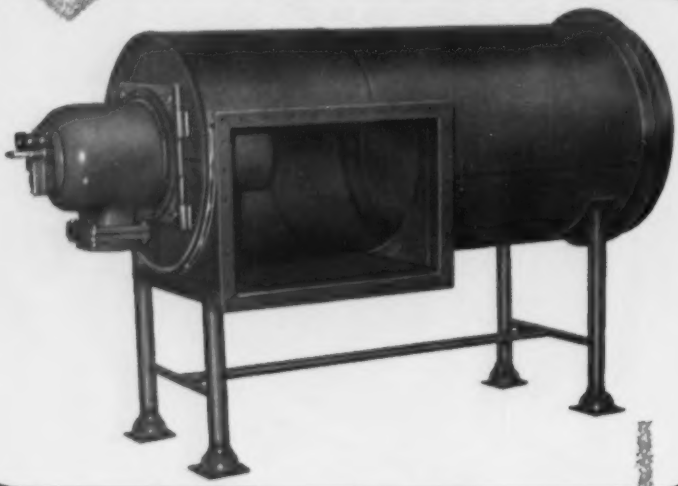
P&A

THE PLUME & ATWOOD MANUFACTURING COMPANY

THOMASTON CONNECTICUT

NEW YORK OFFICE 220 BROADWAY

THERMAL TYPE CA DIRECT FIRED AIR HEATERS



COMPACT . . . EASILY INSTALLED

Readily fitted to ovens, kilns, spray dryers, etc., the THERMAL Type CA Air Heater is an ideal source of heat where products of combustion may be mixed with the air. Oil, gas or combination firing is available without change in heater construction.

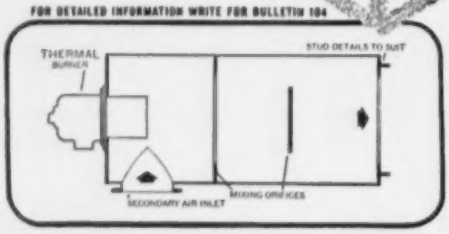
NO REFRACTORY REQUIRED . . .

The THERMAL High Velocity Burner built into the heater permits combustion to be substantially completed within the burner itself. Thus the heater is basically a mixing chamber wherein the products of combustion are mixed with the air being heated. Refractory is not normally used. Successful applications have been made ranging from under 200,000 BTU/hr. to over 20,000,000 BTU/hr. and at all pressure levels.

FOR DETAILED INFORMATION WRITE FOR BULLETIN 104

UNITIZED CONSTRUCTION

Initial cost and upkeep is kept at a minimum through the use of all welded, all metal construction. The CA Air Heaters are normally supplied as complete "package" installations.



OTHER THERMAL PRODUCTS & SERVICES → Gas, Oil & Combination Gas-Oil Burners • Heat Exchangers • Submerged Combustion • Combustion & Heat Transfer Engineering

THERMAL

Thermal Research & Engineering Corp.

CONSHOHOCKEN • PENNSYLVANIA

REPRESENTATIVES IN PRINCIPAL CITIES

Co-Chairman — Roderic E. Kleint, North American Aviation, Los Angeles, California.

Management Looks at Nondestructive Testing in Commercial Aircraft Manufacture — Paul Allen, Beech Aircraft, Wichita, Kansas.

The Relationship of Quality Control to Nondestructive Testing — Brigadier General William P. Farnsworth, Staff Director for Inspection and Quality Control, Office of the Assistant Secretary of Defense, Washington, D. C.

The Application of Nondestructive Testing by a Manufacturer of Military Aircraft—W. J. Maloney, Fairchild Aircraft Company, Hagerstown, Maryland.

Application of Nondestructive Testing in the Manufacture of Aviation Gas Turbine Engines—Fred W. Rohde, Westinghouse Electric Corporation, and National Chairman of Quality Control Committee of Aircraft Industries Association, Kansas City, Missouri.

Wednesday, Oct. 19—9:00 a.m.

MARINE INSPECTION

Chairman—Martin B. Graham, Boston Naval Shipyard, Boston, Massachusetts.

Co-Chairman — Frank L. Johnson, Bethlehem Ship Building Co., Quincy, Massachusetts.

Radiography of Marine Equipment—Willard L. Schwinn and Gilbert R. Forrer, Babcock & Wilcox Company, Barberton, Ohio.

PROGRAM

Ultrasonic Testing of Ship Plate—Howard E. Dickerman, Portsmouth Naval Shipyard, Portsmouth, New Hampshire.

Nondestructive Testing in Naval Construction—William P. Kelley, Bath Iron Works, Bath, Maine.

Radiography of Welds Using Portable X-Ray Equipment—G. W. Leverett, Jr., Long Beach Naval Shipyard, Long Beach, California.

Nondestructive Testing in Construction of Aircraft Carrier "Saratoga"—John L. Cahill, New York Naval Shipyard, Brooklyn, New York.

Wednesday, Oct. 19—2:00 p.m.

ANNUAL MEETING

Chairman—William C. Hitt, National President SNT.

Report on Brussels Meeting—Dr. Gerold H. Tenney, Chairman, SNT International Relations Committee.

de Forest Award (to be announced).

Coolidge Award (to be announced).

LESTER HONOR LECTURE.

The Basis for Standards of Radiation Protection—Dr. Lauriston S. Taylor, Chief Atomic Radiation & Physics Division, National Bureau of Standards, Washington, D. C.

Thursday, Oct. 20—9:00 a.m.

ANNUAL BUSINESS MEETING
ORDNANCE INSPECTION

Chairman — Carlton H. Hastings, Watertown Arsenal, Watertown, Massachusetts.

Electromagnetic Radiation for Testing of Ordnance Products — Dr. Josephy I. Bujes, Naval Ordnance Test Station, Inyokern, California.

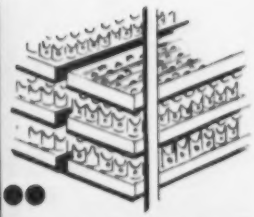
Nondestructive Test Engineering at Frankford Arsenal — Maurice J. Smith and Alfred J. Wysoczanski, Frankford Arsenal, Philadelphia, Pennsylvania.

Production Radiographic Inspection of Propellants—Carl E. Johnson, Silas Mason Company, Cornhusker Ordnance Plant, Grand Island, Neb.

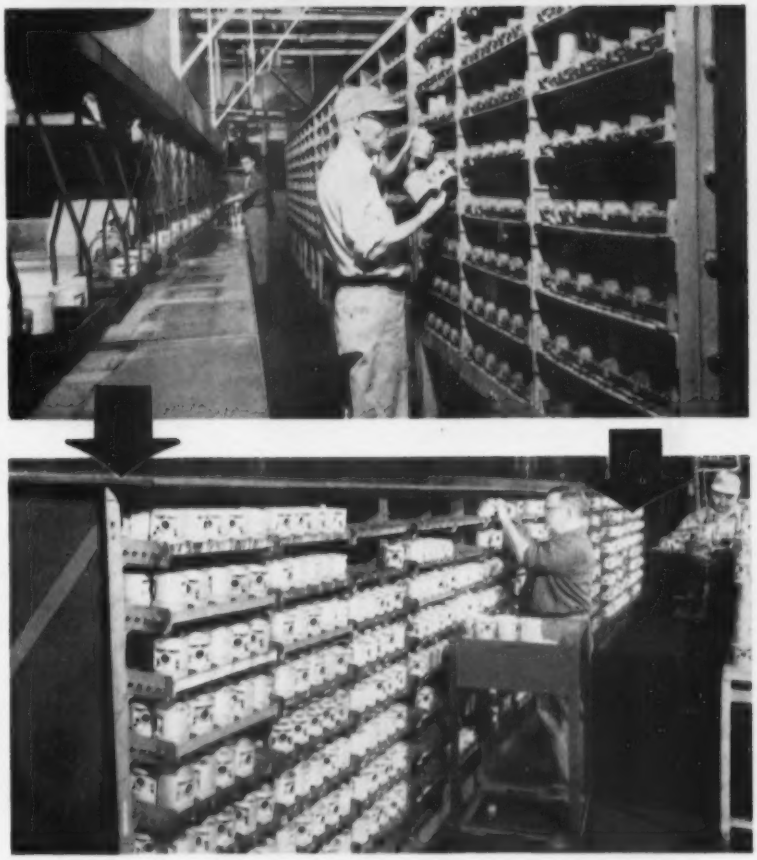
Characteristics of a Closed Link Television X-Ray Inspection System—Daniel Polansky and Edward L. Criscuolo, Naval Ordnance Laboratory, White Oak, Silver Spring, Maryland.

Betratron Strobo-Radiography—R. A. Pulk, Detroit Arsenal, Center Line, Michigan.

EASY IN-EASY *OUT*...



WHEEL CONVEYOR STORAGE RACK



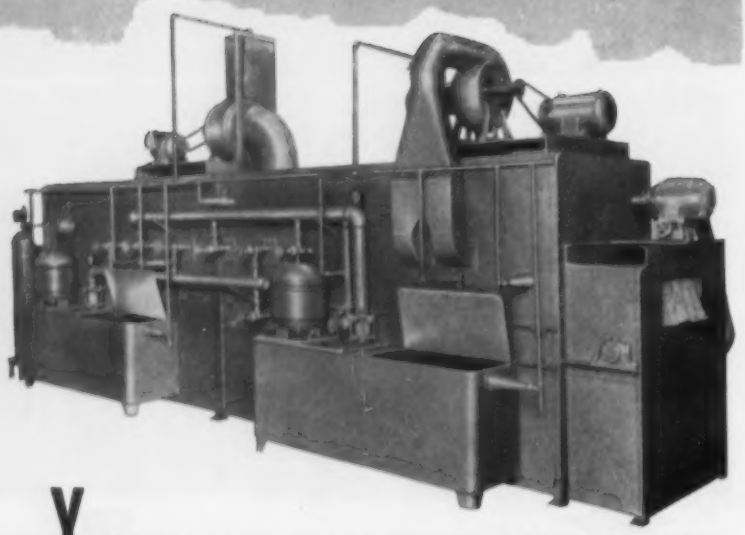
Upper view shows automobile pistons being fed into Logan Wheel Conveyor Storage Rack from trolley conveyor. Pistons are placed into appropriate storage lanes according to size. On discharge side, in lower view, pistons are selected by size as required and delivered to engine assembly line. Confusion and delays are eliminated.

Easy loading at the load end, easy removal at the discharge end . . . and when a part is removed — another rolls into place. That is the principle of Logan Wheel Conveyor Storage Racks: Advantages:
(a) Eliminate confusion and hazards which frequently accompany use of skids and trucks. (b) Save aisle space required for trucking. (c) Stock always ready on first-in-first-out basis. (d) Material flows by gravity. (e) Quick visual check of stock at all times. (f) Save steps, time, money. Adaptable to hundreds of different products in many industries. Perhaps there is an application in your plant. Write for further information, or for nearest Logan engineer.

LOGAN CO., 545 CABEL ST., LOUISVILLE, KY.

Logan Conveyors

Why Invest in an A-F Cleaning or Processing Machine *NOW?*



YOUR costs up . . . competition tougher . . . profits beginning to slip?

Why invest capital funds now in cleaning and processing equipment? Why not wait for a change?

The answer is, "Nothing is so constant as change." You can wait *too* long, you know . . . obsolete equipment may allow your competition to make greater inroads.

OR — you can insure "Quality Control" and lower costs *now* — with modern A-F Cleaning and Finishing Machines so you compete in today's tougher conditions.

INVESTIGATE! Before you order any cleaning or processing machine — write us. If a "standard" A-F Machine will not do the job, A-F Engineers are specialists in custom-built equipment — since 1901.

Every A-F Machine is actually job engineered to lower your costs.

For newest brochure — showing how to select the right machine for the job you have in mind — write today.

YOU CAN SEE THE SUPERIORITY OF A-F CONVEYOR ENGINEERING

A-F

A-F ENGINEERED
Cleaning and Finishing Machines

Plant-wide Conveying Systems
Pre-Engineered Conveyors—Roller, Wheel, Belt, Trolley

THE ALVEY-FERGUSON CO., 558 Disney Street, CINCINNATI 9, OHIO and Azusa, California

Thursday, Oct. 20—2:00 p.m.

CASTING, FORGING AND WELD INSPECTION

Chairman—John Delisa, General Electric Company, Schenectady, New York.

Co-Chairman—Clyde B. Jenni, General Steel Castings Company, Eddystone, Pennsylvania.

Factors Affecting Interpretation of Ultrasonic Indications — Robert H. Hafemeister, Allis-Chalmers Mfg. Co., Milwaukee, Wisconsin.

Geometry Influence on Ultrasonic Testing of Large Forgings—Steve Serabian, General Electric Company, Schenectady, New York.

Ultrasonic Testing of Rail and Railroad Equipment—Dr. Erich Martin, German Federal Railroad, Minden/Westfalen, Germany.

Nondestructive Testing of Lead Linings—Kempton H. Roll, Lead Industries Associates, New York, New York.

Nondestructive Testing of Electrical Forgings—F. Howard Oberlin and R. H. Leith, U. S. Steel Corporation, Homestead Works, Munhall, Pennsylvania.

INDUSTRIAL HEATING EQUIPMENT ASSN.

(In Cooperation with ASM)
Sessions, Convention Hall

Tuesday, Oct. 18—2:00 p.m.

Chairman—Alfred E. Tarr, Assistant to the President, Leeds & Northrup Company.

FURNACES, COMBUSTION EQUIPMENT AND INDUCTION HEATING

Vacuum Melting by Induction & Arc —Frank Chesnut, Electrical Engineer, Ajax Electrothermic Corporation.

Batch Type Strip Annealing Furnaces—Multiple and Single Stack —Floyd Olmstead, President, Lee Wilson Engineering Company.

Combustion and Its Control—Fred Bloom, President, Bloom Engineering Company.

Wednesday, Oct. 19, 2:00 p.m.

MECHANIZED HEAT TREATING EQUIPMENT AND ITS APPLICATION—METALLURGICAL ASPECTS ASSOCIATED WITH INDUCTION HEATING

Mechanized Molten Baths — Leon Rosseau, Vice President, Ajax Electric Company.

PROGRAM

Mechanized Batch Type Furnaces—Martin Neumeyer, Chief Research and Development Engineer, Sunbeam Corporation.

Mechanized Continuous Type Furnaces — George McCormick, Vice President, Industrial Heating Equipment Company.

Metallurgical Aspects Associated with Induction Heating—Dr. Harry Osborn, Technical Director, Tocco Division, Ohio Crankshaft Company.

SPECIAL LIBRARIES METALS DIVISION

Wednesday, Oct. 19—7:00 a.m.

All-day Field Trip to Bethlehem Steel Company Plants.

Wednesday, Oct. 19—8:00 p.m.

Sylvania Hotel

Metals Div. Board Meeting.

Thursday, Oct. 20—9:30 a.m.

Sessions at Sylvania Hotel

INDEXING SYSTEMS IN INDUSTRIAL LIBRARIES

Use of the ASM-SLA System by Industrial Metallurgists—E. C. Wallace, Barber-Colman Company.

Uniterm Coordinate Index System—Robert L. Francisco, General Electric Company.

Battelle Memorial Institute Subject Index System — Robert Gibson, Battelle Memorial Institute.

Thursday, Oct. 20—2:00 p.m.

POWDER METALLURGY

Powder Metallurgy Literature and the Library—Jean Haime, Fansteel Corporation.

Powder Metallurgy with Especial Reference to the Refractory Metals—Harry W. Highriter, Vascoloy-Ramet Corporation.

Thursday, Oct. 20—6:30 p.m.

DINNER AND SOCIAL HOUR

Joint Meeting with Philadelphia Council of Special Libraries Association.

Friday, October 21

Morning—Field Trip to American Society for Testing Materials.

Afternoon—Field Trip to Franklin Institute.

HAVE YOU HEARD ABOUT THIS EXTRAORDINARY CLEANER?

It saves money in paint shops!

Oakite Rustripper is an alkaline material that strips paint, pigment residues and phosphate coatings from steel at the same time that it removes rust and oil.

It saves money in plating shops!

Oakite Rustripper removes rust or heat scale from steel at the same time that it removes oil and other soils. It avoids hydrogen embrittlement, damage to machined surfaces and other disadvantages of acid pickling.

FREE

For more information about how Oakite Rustripper eliminates operations in paint shops and plating shops, send for one or both of the illustrated booklets listed in the coupon.

Technical Service Representatives in Principal Cities of U. S. and Canada

•

Export Division Cable Address: Oakite

OAKITE PRODUCTS, INC.
30H Rector Street, New York 6, N. Y.

Send me free booklet checked below:

☐ "Here's the best shortcut in the field of organic finishing"

☐ "Here's the best shortcut in the field of electroplating"

Name _____

Company _____

Address _____

AUTOMATIC SHEARS

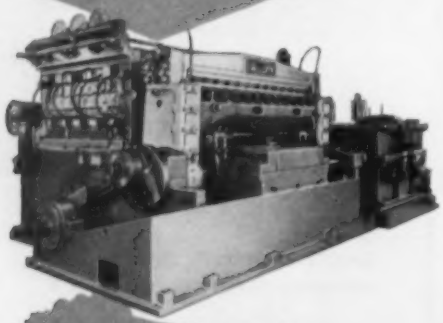
by HALLDEN

flexible design

cutting accuracy

continuous feed

rugged construction



"the shearing specialists"

THE HALLDEN MACHINE CO.

THOMASTON, CONN.

Sales Representatives

The Wean Engineering Co., Inc., Warren, Ohio (Ferrous)

T. E. Dodds, Pittsburgh, Pa. (Non-Ferrous)

W. H. A. Robertson & Co., Ltd., Bedford, England

(Ferrous & Non-Ferrous)

Classified METAL SHOW EXHIBITORS LIST

The 37th National Metal Exposition will be held in Convention Hall, Philadelphia, International Amphitheatre, Oct. 17 to 21. Show hours on Monday, Tuesday and Wednesday are noon to 10:30 p.m. Hours on Thursday and Friday are 10 a.m. to 6 p.m.

On the following pages you will find a list of Metal Show exhibitors classified by products to help you plan your visit. It shows major products or services offered by each exhibitor but does not necessarily list all the products which each exhibitor will display. An alphabetical index begins on p. 268.

Booth

ABRASIVES

Allison Co. 1420
Campbell Machine Div. 1420
Griffith-Raguse & Co., Inc. 1727
Pittsburgh Pressed Steel Co. 1162

AIR TOOLS (See also Grinders, Drills, Etc.)

Spencer Turbine Co. 1946

BEARINGS

Amplex Div., Chrysler Corp. 610

BELTS

Allis-Chalmers Mfg. Co. 1558
Ashworth Bros., Inc. 1461

BLAST CLEANING EQUIPMENT

Pangborn Corp. 1032

BRAZING

Ajax Electric Co. 1619
Banner Mfg. Co. 1251

THE IRON AGE will be at the Metal Show in Booth 1862.

AUTOMOTIVE INDUSTRIES will exhibit at Booth 1216.

BRUSHES, Industrial, Wire Wheel, Etc.

Osborn Mfg. Co. 718

BUSHINGS

Shenango-Penn Mold Co. 650

CARBIDES

Allegheny Ludlum Steel Corp. 120
Carboloy Dept. 1540
Firth Sterling, Inc. 740

EXHIBITORS

Booth

CARBON

National Carbon Co. 1375

CASTINGS, Die

ABC Die Casting Machine Co. 1877
American Die Casting Machinery Co. 1571
Hitchiner Mfg. Co. 926
Pressco Casting & Mfg. Corp. 2028
Titan Metal Mfg. Co. 341

CASTINGS, Ferrous

American Brake Shoe Co 352
Central Foundry Div., GMC 945
Dodge Steel Co. 1443
Electro-Alloys Div. 352
Engineered Castings Div. 352
General Alloys Co. 204
Howard Foundry Co. 208
Janey Cylinder Co. 1263
Lynchburg Foundry Co. 709
National Precision Casting Corp. 1768
Symington-Gould Corp. 1054

CASTINGS, Investment

Casting Engineers, Inc. 891
Hitchiner Mfg. Co. 926

CASTINGS, Nonferrous

Bendix Foundries 1616
Consolidated Industries, Inc. 963
Howard Foundry Co. 208
Janney Cylinder Co. 1263
Morris Bean & Co. 452
National Precision Casting Corp. 1768
Ralle Mfg. Co., Inc. 1620
Shenango-Penn Mold Co. 650
Titan Metal Mfg. Co. 341
Universal Castings Corp. 1856

CASTINGS, Precision

Alloy Precision Castings Co. 1715
Engineered Precision Casting Co. 1269
Arwood Precision Casting Corp. 1327
Hitchiner Mfg. Co. 926
Morris Bean & Co. 452
Precision Metalsmiths, Inc. 1761

CHUCKS

Buck Tool Co. 537

CLAD METALS

Al-Fin Div. 1810

CLAMPS

Lapeer Mfg. Co. 706

CLEANERS AND CLEANING EQUIPMENT

Aeroprojects, Inc. 634
American Wheelabrator & Equipment Corp. 1402
Chemical Corp. 967
Clementina Limited 609
Detrex Corp. 1205
General Ultrasonics Co. 1063
Harshaw Chemical Co. 139
Houghton & Co., E. F. 724
Kelite Corp. 2019
Metalwash Machinery Corp. 1924
Oakite Products, Inc. 1767
Parker Rust Proof Co. 1549

Why four pieces of metal?

. . . with necessary cutting, punching, forming and welding!

. . . How about

Malleable?

Stronger one piece malleable iron casting with better appearance

Better material selection exemplified by this trailer hitch is an everyday development in the malleable iron foundry industry.

The improved design, and therefore *appearance*, is quickly apparent. The big advantages are greater uniformity and dependability, and increased strength—*at lower cost* (in this case, 25% lower cost to the customer). The unit is completely stress relieved and benefits from a better distribution of metal than its fabricated predecessor. Improved damping properties and corrosion resistance are additional gains.

If you are not using malleable iron's remarkable properties, it will pay you to call a malleable foundry and go over your products with their engineers. Skilled in casting design, they show you how to save money and improve your products with Malleable Iron Castings.

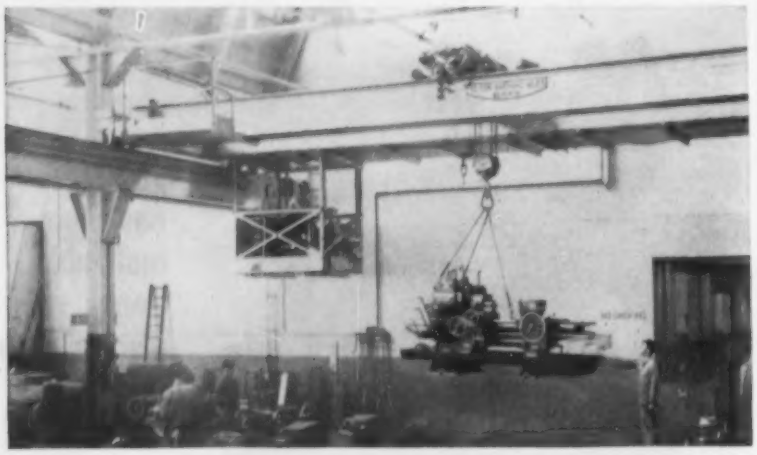
Malleable
FOUNDERS' SOCIETY

1800 Union Commerce Building **Cleveland 14, Ohio**

SHEPARD NILES Crane

CLEAR the HURDLES

on your factory floor!



Why permit machines, materials and men to slow your handling down?

Move loads through the air where there's space to spare by installing a Shepard Niles Crane. Go up and over . . . rather than around . . . obstacles on your production floor.

A Shepard Niles Crane will give you years of fast, efficient load-handling with freedom from costly maintenance. That's because all component parts are designed and built by Shepard Niles expressly for crane service. Choose from light, medium and heavy-duty cranes in slow, medium and high speeds. Available for constant or intermittent duty with cab, floor or pulpit operation.

Write today for latest Crane Bulletin. Ask to have a Shepard Niles representative call. His experience qualifies him to recommend a crane that will meet your plant's needs in every detail.

America's Most Complete Line of Cranes and Hoists since 1903

CRANES
Overhead: Top Running, Inner Running Under Running, Floor or Cab Operated.

HOISTS
Operated from Cab, Floor or Pulpit.

SHEPARD NILES
CRANE AND HOIST CORPORATION

1452 SCHUYLER AVE., MONTOUR FALLS, N.Y.

	Booth
Pennsylvania Salt Mfg. Co.	1272
Phillips Mfg. Co.	512
Pioneer-Central Div.	1525
Swift Industrial Chemical Co.	1975
Turco Products, Inc.	1319
Vacu-Blast Co., Inc.	811
CLOTHING	
Jomac, Inc.	1070
Spencer Turbine Co.	1946
CLUTCHES	
Fawick Airflex Div.	507
COATED STRIP	
Enamelstrip Corp.	1630
COMPOUNDS, Cleaning	
Diversey Corp.	844
COMPOUNDS, Cutting, Grinding, Metal Drawing, Etc.	
Houghton & Co., E. F.	724
CONTROLLERS AND CONTROLS	
Illinois Testing Laboratories, Inc.	919
Schrader's Son Div.	1458
Tenney Engineering, Inc.	2330
CRANES	
Coles Cranes Inc.	1387
Harnischfeger Corp.	1657
CUT-OFF MACHINES	
Allison Co.	1420
American Chain & Cable Co., Inc.	1044
Campbell Machine Division	1420
Delta Power Tool Div., Rockwell Mfg. Co.	1530
CUTTING (See Welding)	
CUTTING COMPOUNDS	
Cities Service Petroleum, Inc.	453
Gulf Oil Corp.	1414
Johnson & Sons, Inc., S. C.	750
Socony-Mobil Oil Co., Inc.	1350
Sun Oil Co.	922
Texas Co.	743
CUTTING MACHINES	
American Pullmax Company, Inc.	1427
Firth Sterling, Inc.	740
Stone Machinery Co.	551
Wells Manufacturing Corp.	730
CYLINDERS, Air, Hydraulic	
Bendix Aviation Corp.	1525
Mead Specialties Co.	1872
Weatherhead Co.	717
DIAMONDS AND DIAMOND TOOLS	
Sentry Co.	635
Service Diamond Tool Co.	2135
DIES, DIE SETS	
Carboloy Dept., GE Co.	1540
National Lead Co.	130
Standard Die Set Mfrs., Inc.	1675
Wales-Strippit Corp.	1210

EXHIBITORS

Booth

DRILLS

Atlas Press Co. 1349
Chicago Tool & Engineering Co. 1654
Delta Power Tool Div. 1530
Electro Arc Sales Co. 2242
Rockwell Mfg. Co. 1530

DUPLICATORS

Walker-Turner Div. 1450

DUST COLLECTORS

American Wheelabrator & Equipment Corp. 1402
Torit Mfg. Co. 1454

DYE PENETRANT

Turco Products, Inc. 1319

ELECTRODES

National Carbon Co. 1375

ENGRAVING MACHINES

Green Instrument Co. 2148
New Hermes Engraving Machine Corp. 1273

FASTENERS

Acme Steel Company 1965
Eaton Mfg. Co. 1533
Goodrich Co., B. F. 641
Heli-Coil Corp. 617
Reliance Div 1533
Southco Division 1445
South Chester Corp. 1445
Stimpson Co., Edwin B. 411
Tinnerman Products, Inc. 1467
Townsend Co. 1371
U. S. Expansion Bolt Co. 1374
Waldes Kohinoor, Inc. 1466

FERROALLOYS

Electro Metallurgical Co. 1375
Union Carbide & Carbon Corp. 1375

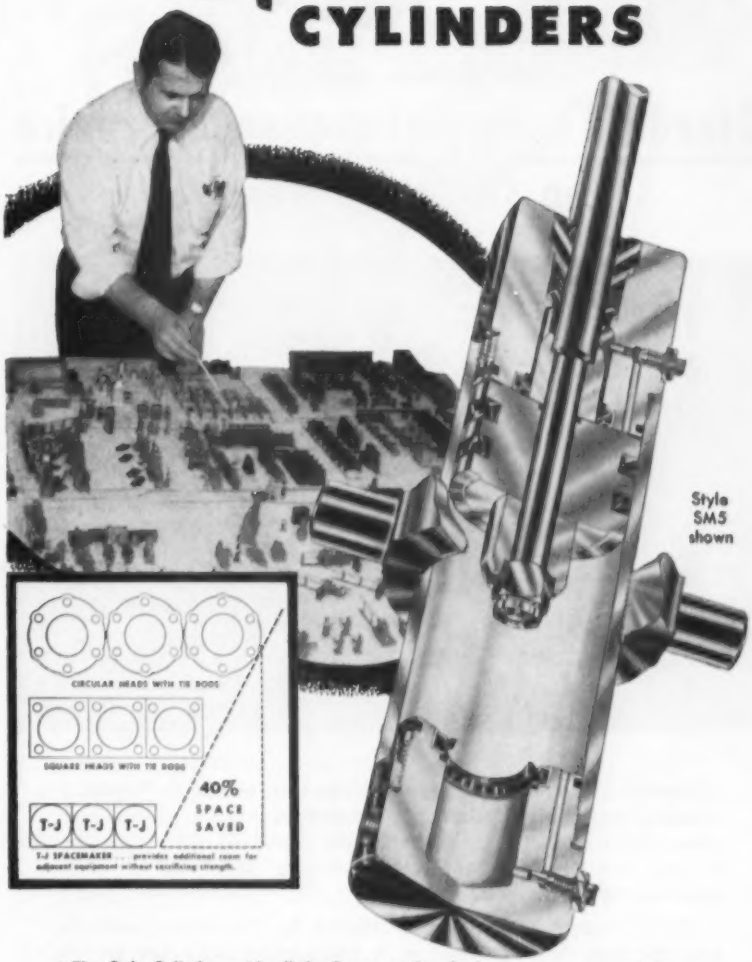
FILTERS

Commercial Filters Corp. 1419

"Had it shipped over from the states."

Automate for top performance with...

T-J Spacemaker CYLINDERS



Style SM5 shown

- The Only Cylinders with all the Extras as Standard
- OIL pressure to 750—AIR to 200 P.S.I.
- New Compact Design . . . Saves up to 40% Space
- Proven Performance . . . with Extra High Safety Factor
- Super Cushion Flexible Seals for Air . . . New Self-Aligning Master Oil Cushion
- Hard Chrome Plated Bodies and Piston Rods (Standard)
- Only from T-J can you get these new ingenious cushion designs

OFF SHELF DELIVERY

More and more of industry's automation problems today—solved with T-J Spacemaker Cylinders! New compact design and many more plus features for a new high in efficient cylinder performance and dependability. Wide range of styles, capacities . . . to help you *save labor, reduce costs* on all kinds of push-pull-lift jobs. Send for bulletin SM-155-1. The Tomkins-Johnson Co., Jackson, Mich.

T-J TOMKINS-JOHNSON
VALVES · AIR AND HYDRAULIC CYLINDERS · CUTTERS · CLINCHERS

Member of the National Fluid Power Association

"doodles" or complete plans?

Whichever you have

Standard's complete conveyor service

can save you money!

Many a complex conveying problem has been solved by Standard engineers with only a customer's "doodle" drawing to follow. And often when complete plans are submitted, Standard engineers make recommendations that improve the conveyor application . . . save time and money as well.

If you prefer to do your own conveyor planning, we suggest you send for Bulletin 63-D. Here in 28 fast-reading pages you get all the specifications, drawing and application data on a wide range of Standard Conveyors. This includes gravity and power conveyors and accessory equipment: Handidrive pre-built conveyor units and the complete, self-contained portable conveyor units listed below.

Call your Standard Conveyor representative listed in your classified phone book — or send for copy of Standard General Catalog — address Dept. IA-105

STANDARD CONVEYOR COMPANY
General Offices: North St. Paul 9, Minnesota
Sales and Service in Principal Cities

Nearly 50 years of conveyor experience

Standard

GRAVITY & POWER Conveyors
ROLLER • SLAT • WHEEL
SECTIONAL • BELT • CHAIN • PUSH-BAR
PORTABLE CONVEYOR UNITS:
HANDIBELT • INCLINEBELT • EXTENDOVEYOR • UTILITY BELT-VEYOR
HANDIPILER • LEVEL BELT • LITEWATE • HANDIDRIVE
PNEUMATIC TUBE SYSTEMS

	Booth
FORGINGS	
Consolidated Industries, Inc.	963
Drop Forging Assn.	1278
National Cored Forgings Co.	431
Rolock, Inc.	1724
FURNACES AND ACCESSORIES	
Ajax Engineering Corp.	1619
American Gas Furnace Co.	1914
Continental Industrial Engineers, Inc.	1701
Electric Furnace Co.	334
Gas Appliance Service, Inc.	1932
Gas Machinery Co.	1942
General Alloys Co.	204
General Electric Co. (Apparatus)	1572
Harper Electric Furnace Corp.	1815
Hauck Manufacturing Co.	1921
Hevi Duty Electric Co.	808
Hones, Inc., Chas. A.	1804
Industrial Heating Equipment Co.	631
Ipsen Industries, Inc.	420
Kemp Mfg. Co., C. M.	1801
Laboratory Equipment Corp	2159
Leeds & Northrup Co.	1822
Lindberg Engineering Co.	230
Metlab Co.	1047
National Research Corp.	1577
Selas Corp. of Amer.	1601
Surface Combustion Corp.	304
Upton Electric Furnace Co.	1867
FURNITURE, Shop	
Sentry Co.	635
GAGES	
Industrial Tectonics, Inc.	835
Magnaflux Corp.	446
GAS, Industrial	
American Gas Association	1910
Pyrofax Gas Corp.	1375
GENERATORS, Power Units	
Allis-Chalmers Mfg. Co.	1558
HARD FACING ALLOYS	
Haynes Stellite Co.	1375
HEAT EXCHANGERS	
Allis-Chalmers Mfg. Co.	1558
Haveg Corp.	2055
HEAT-TREATING EQUIPMENT	
Ajax Electric Co.	1619
American Cyanamid Co.	530
Drever Co.	1972
Electric Furnace Co.	334
Heatbath Corp.	1362
Ipsen Industries, Inc.	420
Leeds & Northrup Co.	1822
Lindberg Engineering Co.	230
Lithium Co.	1901
Park Chemical Co.	330
Surface Combustion Corp.	304
Upton Electric Furnace Co.	1867
Waukee Engineering Co.	1239
HEATING UNITS	
American Electrical Heater Co.	2060
Brown Fintube Co.	1309
Plate-Coil Div.	1777
Tranter Mfg., Inc.	1777

EXHIBITORS

Booth

INDUCTION HEATING EQUIPMENT

Ajax Electrothermic Corp. 1619
Allis-Chalmers Mfg. Co. 1558
General Electric Co. 1572
Induction Heating Corp. 1242
Lepel High Frequency Labs., Inc. 1256
Magnethermic Corp. 1740
Ohio Crankshaft Co. 1509
Tocco Div. 1509
Weltronic Co. 1955
Westinghouse Electric Corp. 1510

INSTRUMENTS, Testing, Measuring, Etc.

American Chain & Cable Co., Inc. 1044
American Cystoscope Makers Inc. 1678
American Optical Co. 925
Applied Research Laboratories 1219
Baird Associates, Inc. 852
Barber-Colman Co. 809
Bausch & Lomb Optical Co. 440
Branson Instruments, Inc. 831
Bristol Co. 1658
Brush Electronics Co. 1728
Buehler, Ltd. 416
Ercona Camera Corp. 2036
Exomet, Inc. 2128
Foxboro Co. 1377
Kent Cliff Laboratories Div. 1055
Illinois Testing Laboratories, Inc. 919
Jarrell-Ash Co. 344
Leeds & Northrup Co. 1822
E. Leitz, Inc. 1071
Magnaflux Corp. 446
Magnetic Analysis Corp. 2024
Metals & Controls Corp. 1440
National Spectrographic Labs., Inc. 540
Pyometer Instrument Co., Inc. 1439
Scientific Electric Div. 1279
Sperry Products, Inc. 1320
Starrett Co., L. S. 1720
Taylor Instruments Co. 966
Torsion Balance Co. 1055
Waukee Engineering Co. 1239
Wheelco Instruments Div. 809
Wilson Mechanical Instrument Div. 1044
Ziess, Inc., Carl 2036

LABORATORIES

National Spectrographic Labs., Inc. 540
South Florida Test Service 2215
Triplett & Barton, Inc. 254

LABORATORY EQUIPMENT

Laboratory Equipment Corp. 2159

LAPPING MACHINES

Crane Packing Co. 1567

LATHES

Atlas Press Co. 1349
Versa-Mil Co. 1778

LIBRARY SERVICE

Special Libraries Assn. 123

LOCKS

Yale & Towne Mfg. Co. 1557

LOW TEMPERATURE EQUIPMENT

Cincinnati Sub-Zero Products Co. 970

that meet your specs
. . . and your timetable

The smaller part shown is a lever shaft for automatic voting machines. Made of square stock it is 3/16″ x 7″ long, it must be absolutely straight and free of all burrs and cut-off points. Spacing between the grooves is held to .005″ and groove widths and diameters to .003″

The larger part is a 1″ diameter by 9¾″ long washing machine shaft. It is induction-hardened on the unthreaded end to approx. 50 Rockwell "C". Threads must be concentric to the O.D. of the shaft within .004″ total indicator reading, and the tolerance on the finished ground diameter is only .0005″!

These parts are typical of the ultra-precision special parts turned out by the millions at Western. Your jobs may not be as fussy as these, but large or small (from wire size to 4¾″ round), plain or fancy, you can save yourself money, time and trouble by getting quotations on your *toughest* jobs from Western — today.

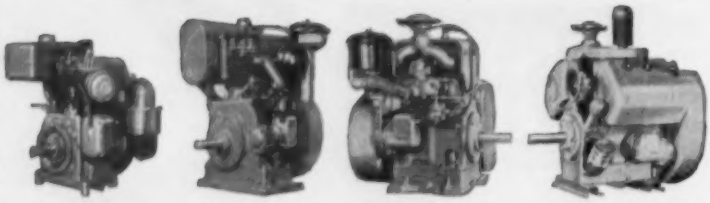
Western Automatic
Machine Screw Company
380 Woodland Ave., Elyria, O.

Precision Screw Products, Parts and Assemblies Since 1873

Most Specified as

STANDARD POWER COMPONENTS ON ORIGINAL EQUIPMENT . . .

WISCONSIN HEAVY-DUTY *Air-Cooled* ENGINES



Single Cylinder 3 to 8¼ hp. | Single Cylinder 6 to 9 hp. | Two-Cylinder 7 to 15 hp. | V-type 4-cyl. 15 to 36 hp.

IN THE FARM FIELD...

Specified by leading "blue chip" builders of farm and orchard equipment for: combines, pickup balers, forage harvesters, garden tractors, field crop and orchard sprayers, irrigation pumping units, portable elevators and many other machines.

Wisconsin-powered Model 87 New Holland Baler.

IN THE CONSTRUCTION FIELD...

Specified for leading makes of concrete mixers, concrete finishers, concrete cutters, power "wheelbarrows", hoists, bituminous spreaders, ditch diggers and trenchers, road rollers, conveyors, compressors, arc welders, pumping units, standby electric generators, etc.

Wisconsin-powered Smith DeLuxe Truck Mixer.

IN THE OIL FIELD...

Widely specified as integral power for many types of oil field utility units such as oil well pumps, gathering pumps, dope kettles, pipe straightening machines, compressors, salt water disposal pumps, trenchers, standby power units, etc.

Wisconsin-powered Oil Field Booster Pump.

IN THE INDUSTRIAL FIELD...

Specified for plant floor sweepers and scrubbers; fork-lift, pallet and platform trucks; plant fire-fighting equipment; truck and trailer refrigeration systems; power lawn mowers and leaf sweepers and a great variety of specialized applications in many fields.

Wisconsin-powered Hyster Fork Lift Truck.

Because Wisconsin Heavy-Duty Air-Cooled Engines match the equipment of which they become integral units . . . because they fit both the machine and the job with maximum power advantage and minimum maintenance cost . . . those fine engines merit the serious consideration of design engineers and builders of equipment utilizing engine power within a 3 to 36 hp. range. Write for Bulletin S-179 and tell us about your power problem.

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46, WISCONSIN

	Booth
LUBRICANTS	
Gulf Oil Corp.	1414
Houghton & Co., E. F.	724
Johnson & Son, Inc., S. C.	750
Kerns Co., L. R.	1250
Shell Oil Co.	1749
Socony-Mobil Oil Co., Inc.	1350
Sun Oil Co.	922
Swan Finch Oil Corp.	1662
Texas Co.	734
MACHINE TOOLS & ACCESSORIES	
American Positive Grip Vise Corp.	2047
Diamond Machine Tool Co.	2124
Green Instrument Co.	2148
H & H Research Co.	1051
Kasson Die & Motor Corp.	1277
Lempco Products, Inc.	560
Man-Au-Cycle Corp. of America	1159
Mead Specialties Co.	1872
Reed-Prentice Corp.	602
S & S Machinery Co.	1159
Tapmatic Corp.	1340
Tubular Micrometer Co.	950
MACHINES, Special	
Cold Metal Products Co.	338
Continental Industrial Engineers, Inc.	1701
Engelberg Huller Co., Inc.	1073
Kearney & Trecker Corp.	1450
Taylor Dynamometer & Machine Co.	965
Tranter Manufacturing, Inc.	1777
United Shoe Machinery Corp.	735
MAGNETS	
Eriez Mfg. Co.	1917
MARKING MACHINES	
Cushman & Denison Mfg. Co.	2246
Marsh Stencil Machine Co.	2147
MATERIALS HANDLING (See also specific items)	
Grand Specialties Co.	101
Merrill Brothers	1354
Olin Mathieson Chemical Corp.	524
METAL FINISHING (See also, Cleaners)	
Allied Research Products, Inc.	962
American Chemical Paint Co.	518
Bede Products Corp.	1361
De Vilbiss Co.	751
Gasway Corp.	1477
Johnson & Son, Inc., S. C.	750
Lord Chemical Corp.	359
Metalizing Co. of America	2061
Spee-Flo Mfg. Corp.	2012
Tickle Engineering Works, Inc.	1808
Westfield Sheet Metal Works, Inc.	760
Turco Products, Inc.	1319
MILLING MACHINES	
Kearney & Trecker Corp.	1450
N. Ransohoff, Inc.	1608
MOTORS, Electric	
Allis-Chalmers Mfg. Co.	1558
Dumore Co.	1539
Peerless Electric Co.	1155
U. S. Electrical Motors, Inc.	1816

EXHIBITORS

Booth

NONFERROUS METALS

American Brass Co. 211
American Nickeloid Co. 1275
Beryllium Corp. 618
The Brush Beryllium Co. 437
Cooper Metallurgical Associates 2048
Chromalloy Corp. 2154
Climax Molybdenum Co. 421
International Nickel Co., Inc. 309
Malayan Tin Bureau 1772
Metal & Thermit Corp. 153
National Lead Co. 130
Olin Mathieson Chemical Corp. 524
Sall Metals Co., Inc. 1062
Tin Research Institute, Inc. 439
Titanium Metals Corp. of America 624
Vanadium Corp. of America 816
Whitehead Metal Prod. Co., Inc. 1344
Westinghouse Electric Corp. 1510

OIL SEALS

Crane Packing Co. 1567
Fawick Corp. 507

PACKING, Leather, Metal, Rubber, Asbestos, Etc.

Crane Packing Co. 1567

PAINT SPRAY EQUIPMENT

Binks Mfg. Co. 1807
Ransburg Electro-Coating Corp. 1983
Scientific Electric 1279

PIPE

American Cast Iron Pipe Co. 1830
Lynchburg Foundry Co. 709
National Carbon Co. 1375
Bakelite Co. 1375

PLANT EQUIPMENT, Supplies

Best Mfg. Co. 1268
Bradley Washfountain Co. 1861
Falstrom Co. 651
Scott Paper Co. 915

PLATES, SURFACE

Acme Tool Co. 1051

PLATING EQUIPMENT

Bart Mfg. Co. 1058
Circo Equipment Co. 1378
E. I. Du Pont de Nemours & Co., Inc. .. 1457
North American Philips Co. 1154

PLYWOOD

U. S. Plywood Corp. 1871

POLISHING MACHINERY

Hammond Machinery Builders, Inc. 1453
Production Machine Co. 1339

POWDER METALLURGY

American Electro Metal Corp. 1843
Amplex Div. 610
Metallurgy, Inc. 218
Plastic Metals Div. 1330
National-U. S. Radiator Corp. 1330
Powdered Metal Products Div. 1557
Yale & Towne Mfg. Co. 1557

POWER TRANSMISSION EQUIPMENT

Reeves Pulley Co. 445

The **MOST COMPACT** and **MANEUVERABLE** 5,000 pound Fork Lift Truck ever made!

Here, in the new Model 500, are the performance features you requested . . . NEW compactness and maneuverability previously found only in much smaller units. NEW power to spare for handling up to 2½-ton loads. NEW day-long efficiency under the most severe working conditions from both gasoline and Diesel models.

Here are versatile power, capacity and performance long needed in a compact, maneuverable fork lift truck. Find out how the new Towmotor Model 500 fork lift truck can meet *your* handling requirements . . . and turn *more* of your present handling costs into profit. For complete information, call or write your local Towmotor Representative, or TOWMOTOR CORPORATION, Div. 1510, 1226 E. 152nd St., Cleveland 10, Ohio.

TOWMOTOR
THE ONE-MAN-GANG

FORK LIFT TRUCKS and TRACTORS

★ NEW Power and Compactness
★ NEW High In Maneuverability
★ NEW Handling Speed And Efficiency
★ NEW Driver Comfort
★ PLUS *All* Other TOWMOTOR Advantages

Manufactured Only By Towmotor Corporation—The Pioneer Maker Of Fork Lift Trucks

METAL SHOW EXHIBITORS

Booth

PRESSES

Baldwin-Lima-Hamilton Corp. 1954
Cleveland Punch & Shear Works Co. . 1739
Mead Specialties Co. 1872
Service Machine Co. 1358, 1640
F. J. Stokes Machine Co. 1302

PUMPS

Allis-Chalmers Mfg. Co. 1558
Yale & Towne Mfg. Co. 1557

RADIOACTIVE EQUIPMENT

Atomic Energy of Can. Ltd., Comm. Prod. Co. 1929
Mitchell Radiation Products Corp. 2016
Technical Operations, Inc. 2023

REFRACTORIES

Kolcast Industries, Inc. 1561
National Carbon Co. 1375

RUST PREVENTIVES

Parker Rust Proof Co. 1549
Socony-Mobil Oil Co., Inc. 1350

SAFETY EQUIPMENT

Pendergast Safety Equip. Co. 2054

SAWS AND SAWING MACHINES

Skil Corp. 1980
Starrett Co., L. S. 1720
Walker-Turner Division 1450
Wells Manufacturing Corp. 730

SCREW MACHINE PARTS

Stimpson Co., Edwin B. 411

SEALS AND RETAINERS, Oil or Grease

Fawick Airflex Co., Inc. 507

SHAPERS

Atlas Press Co. 1349

SHOT PEENING MACHINERY

American Wheelabrator & Equipment Corp. 1402

SLITTERS

Stanat Mfg. Co. 1355

SOLDERS

Alpha Metals, Inc. 955
National Lead Co. 130

SEPARATORS, Magnetic

Dings Magnetic Separator Co. 2132

STAMPINGS, Extrusions, Etc.

Heintz Mfg. Co. 1758
Mullins Mfg. Co. 918
Phoenix Products Co. 1672

STEEL, Tool, Alloy, Stainless

Allegheny Ludlum Steel Corp. 120
Copperweld Steel Co. 310
The Cold Metal Products Co. 338
Delaware Tool Steel Corp. 1933
Disston & Sons, Inc. 1753
Firth Sterling, Inc. 740
International Nickel Co. 309
Ryerson & Son, Inc., Jos. T. 931
Starrett Co., L. S. 1720
Universal Cyclops Steel Corp 1520
Vanadium Alloy Steel Co. 104
Versa-Mil Co. 1778

STRAPPING, Steel

Brainard Steel Div. 1719
Sharon Steel Corp. 1719

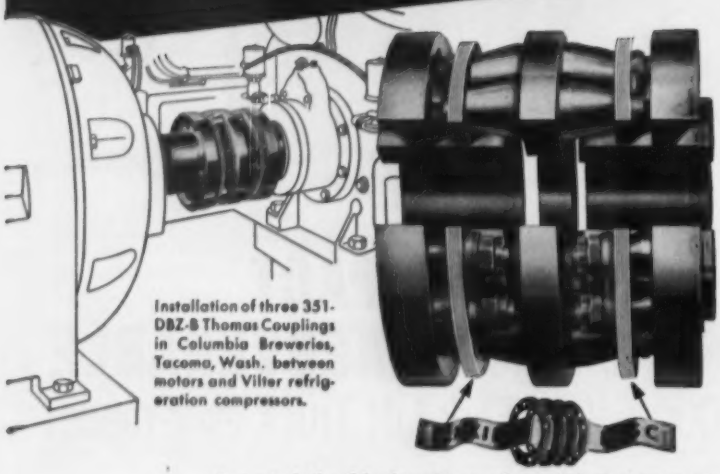
TAPS

Electro Arc Sales Co. 2242
Elox Corporation of Michigan 1027

TEMPERATURE CRAYONS

Lake Chemical Co. 506
Markal Co. 506
Tempil Corp. 1533

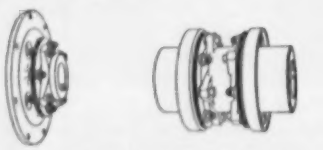
THOMAS FLEXIBLE COUPLINGS...
for more years of better service!



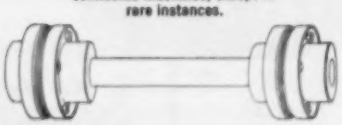
Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES	
FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.



Write for our new Engineering Catalog No. 51A

THOMAS FLEXIBLE COUPLING COMPANY

Largest Exclusive Coupling Manufacturer in the World

WARREN. PENNSYLVANIA, U.S.A.

Booth

TESTING MACHINES

American Machine & Metals, Inc. 149
Baldwin-Lima-Hamilton Corp. 1954
Branson Instruments, Inc. 831
Brush Electronics Co. 1728
Detroit Testing Machine Co. 545
Electro Circuits, Inc. 2210
General Electric Co. 1572
Gries Industries, Inc. 240
W. J. Hacker & Co., Inc. 1372
High Voltage Engineering Corp. 625
Illinois Testing Laboratories, Inc. 919
Instron Engineering Corp. 1415
King, Andrew 320
Krouse Testing Machine, Inc. 1880
Nuclear Research Corp. 1857
Riehle Testing Machines Div. 149
Steel City Testing Machines, Inc. 324
Testing Equip. Co., Inc. 2329
Tinius Olsen Testing Machine Co. 1428

TOOLS, Boring, Turning, Cutting, Etc.

Acme Tool Co. 1051
Carboloy Dept. GE Co. 1540
East Shore Machine Prod. Co. 1756
Nelco Tool Co., Inc. 1163
Pedrick Tool & Machine Co. 741
Weatherhead Co. 717

TOOLS, Layout, etc .(See Machine Tool Accessories)

Knight Models, Inc. 1860

TOOLS, Portable

Black & Decker Mfg. Co. 1707
Lufkin Rule Co. 805
Manco Mfg. Co. 1471
Nord International Corp. 1257
Pneuma-Serv Inc. 640
Stanley Electric Tool Div. 2123
Thor Power Tool Co. 731

TUBING

Babcock & Wilcox Co. 241
H & H Research Co. 1051
Precision Tube Co. 1167
Ryerson & Son, Inc., Jos. T. 931
Superior Tube Co. 1470

VACUUM EQUIPMENT

Consolidated Vacuum Corp. 836
High Vacuum Equipment Corp. 817

Kinney Mfg. Div. 1171
Optical Film Engineering Co. 1067
Seal Cast Co., Inc. 2153

VALVES & FITTINGS

Fawick Airflex Co., Inc. 507
Diesel Power Inc. 2150
Haveg Corp. 2055
Industrial Products Suppliers 958

Modern Air Corp. 959
Pantex Mfg. Corp. 2015
Weatherhead Co. 717

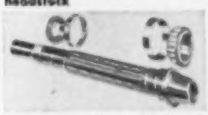
WELDING

Aro Spotwelders Corp. 1316
Air Reduction Sales Co. 1750
Arcair Co. 1066
Banner Mfg. Co. 1251

SHELDON
CHICAGO U.S.A.

NEW Sebastian 13"
A-5 GEARED HEAD
PRECISION LATHE

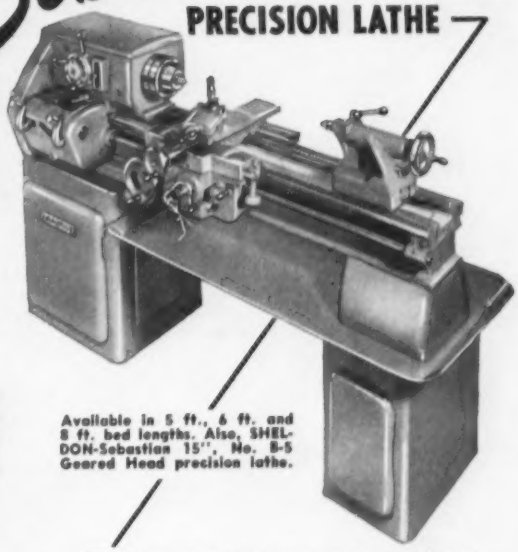
Speed changes easily made by revolving speed dial on headstock


Heavy, multiple Splined Spindle with "Zero Precision" tapered roller bearings

Quick change Gear box provides 60 different threads or feeds — has built-in lead screw reverse

Massive 1-piece, double walled apron with gears running in oil has "1-shot" pressure lubrication system for carriage and ways

Cam action tailstock clamp permits rapid release and instant locking of tailstock


Available in 5 ft., 6 ft. and 8 ft. bed lengths. Also, SHELDON-Sebastian 15", No. B-5 Geared Head precision lathe.

This is a completely new Sebastian Lathe *designed and built by Sheldon* . . . a rugged work horse with extra power, toolroom accuracy and all the modern features that make for money-saving production . . . with all controls centrally grouped in easy reach for safe efficient operation.

Modern, heavy cast-iron pedestal (included in base price of lathe) completely encloses motor and drive . . . with storage space in tailstock leg for tools and chucks.

Run this new Sebastian lathe. Test its performance. You will appreciate the powerful cuts that this lathe can take. Write for circulars on 13" and 15" Sebastian lathes and name of nearest dealer where you can see and operate these outstanding lathes.

SHELDON MACHINE CO., INC.
4201 N. Knox Ave., Chicago 41, Illinois

METAL SHOW EXHIBITORS

	Booth
Blakeslee & Co., G. S.	1819
Cam-Lok Div	1827
Coast Metals, Inc.	1907
Driver Co., Wilbur B.	515
Electric Arc, Inc.	1650
Empire Products, Inc.	1827
Eutectic Welding Alloys Corp.	1225
General Electric Co.	1572
Graham Mfg. Corp.	2031
Harnischfeger Corp.	1657
Heath Engineering Co.	960
The Hobart Brothers Co.	1020
Lincoln Electric Co.	231
Linde Air Products Co.	1375
Metal & Thermit Corp.	153
National Torch Tip Co.	2149
National Welding Supply Assn.	1961
Reid-Avery Co., Inc.	1519
Rockwell Mfg. Co.	1530
Sciaky Bros., Inc.	946
Scientific Electric Div	1279
Smith Corp., A. O.	1842
Smith Welding Equipment Corp.	1714
Thomson Electric Welder Co.	971
Vickers, Inc.	1771
Westinghouse Electric Corp.	1510

WIRE, Screen, Cloth, Belting

Audubon Wire Cloth Corp.	1850
Cambridge Wire Cloth Co.	1839
Driver-Harris Co.	534
Manganese Steel Forge Co.	1850
United Wire & Supply Corp.	2009

WIRE MACHINERY

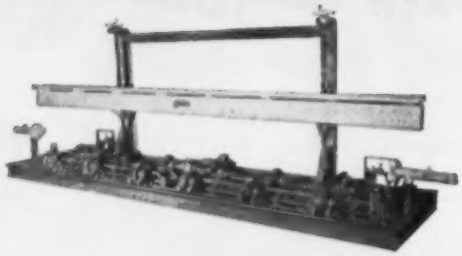
Stanat Mfg. Co.	1355

X-RAY APPARATUS

Acme Steel Co., Chicago, Ill.	1965
Acme Tool Co., New York, N. Y.	1051
Holger Andreasen, Inc.	961
General Electric Co. X-Ray Dept.	660
Machlett Laboratories, Inc.	2049
Mitchell Radiation Products Corp.	2016
Rockwell Mfg. Co.	1530

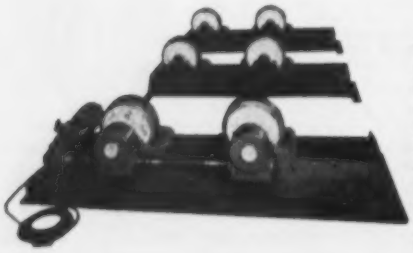
WEBB TANK PRODUCTION MACHINERY

REED TRACK SUPPORTS For Automatic Welding Head Carriages



Increase production — use this fixture on 4' to 12' diameter work. Welding track is 24' to 34' long. Powered vertical adjustment is available for all models. May be used with your present turning rolls, welding positioners, special jigs for straight seam work, or portable type rolls illustrated below.

REED Portable Type TURNING ROLLS



For manual or automatic welding and other operations requiring rotation of a cylindrical vessel. Capacities range from 3 tons to 75 tons; larger units built to special order. Powered by electric motor with variable speed transmission. Readily portable, they may be used free or anchored to the floor as desired.

Horn Type Fixtures | Cylinder Flange Offsetters | Assembly Fixtures | Unit Type Turning Rolls | Portable Turning Rolls | Automatic Welding Track Supports

FOR ILLUSTRATED LITERATURE WRITE DEPT. E

REED EQUIPMENT DIVISION
THE WEBB CORP. WEBB CITY, MO. U. S. A.

Alphabetical List of Exhibitors

A B C Die Casting Machine Co.	1877
Acme Steel Company	1965
Acme Tool Company	1051
Aeroprojects, Inc.	634
Air Reduction Sales Co.	1750
Ajax Electric Co.	1619
Ajax Electrothermic Corp.	1619
Ajax Engineering Corp.	1619
Al-Fin Div.	1810
Allegheny Ludlum Steel Corp.	120
Allied Research Products, Inc.	962
Allis-Chalmers Mfg. Co.	1558
Allison Co.	1420

"Guess who just won $50,000 in the football pool, Meathead?"

	Booth
Alloy Precision Castings Co.	1715
Alpha Metals, Inc.	955
American Brake Shoe Co.	352
American Brass Co.	211
American Cast Iron Pipe Company	1830
American Chain & Cable Co., Inc.	1044
American Chemical Paint Co.	518
American Cyanamid Co.	530
American Cystoscope Makers, Inc.	1678
American Die Casting Machinery Co.	1571
American Electrical Heater Co.	2060
American Electro Metal Corp.	1843
American Gas Assn.	1910
Amer. Gas & Elec. Service Corp.	1410
American Gas Furnace Co.	1914
American Machine & Metals, Inc.	149
American Nickeloid Co.	1275
American Non-Gran Bronze Co.	1950
American Optical Co.	925
American Positive Grip Vise Corp.	2047
American Pullmax Co., Inc.	1427
American Steel Abrasives Co.	1162
American Wheelabrator & Equip. Co.	1402
Amplex Div.	610
Anderson & Sons, Inc.	1708
Applied Research Laboratories	1219
Arcair Co.	1066
Aro Spotwelders Corp.	1316
Arwood Precision Casting Corp.	1327
Ashworth Brothers, Inc.	1461
Atlas Press Co.	1349
Atomic Energy of Canada, Ltd.	1929
Audubon Wire Cloth Corp.	1850
Automotive Industries	1216
Babcock & Wilcox Co.	241
Baird Associates, Inc.	852
Bakelite Co.	1375
Baldwin-Lima-Hamilton Corp.	1954
Balteau Electric Corp.	115
Banner Manufacturing Co.	1251
Barber-Colman Co.	809
Bart Manufacturing Corp.	1058
Bausch & Lomb Optical Co.	440
Bean & Co., Morris	452
Bede Products Corp.	1361
Bendix Aviation Corp.	1525
Bendix Foundries	1616
Beryllium Corp.	618
Best Manufacturing Co.	1268
Binks Manufacturing Co.	1807
Black & Decker Manufacturing Co.	1707
Blakeslee & Co., G. S.	1819
Bradley Washfountain Co.	1861
Brainard Steel Div.	1719
Branson Instruments, Inc.	831
Bristol Co.	1658
Brown Fintube Co.	1309
Brush Beryllium Co.	437
Brush Electronics Co.	1728
Buck Tool Co.	537
Buehler, Ltd.	416
Cambridge Wire Cloth Co.	1839
Cam-Lok Div.	1827
Campbell Machine Div.	1420
Carbide & Carbon Chemicals Co.	1375
Carboloy Dept.	1540
Carborundum Co.	1727
Carlingo Commodities Corp.	1310
Casting Engineers, Inc.	841
Central Foundry Div.	945
Chain Lock Process Co.	2169
Chemical Corp.	967
Chicago Tool & Engineering Co.	1654
Chilton Publications	1216
Chromalloy Corp.	2154
Chrysler Corp.	610
Cincinnati Sub Zero Products	970
Circo Equipment Co.	1378
Cities Service Petroleum, Inc.	453
Clayton Sherman Abrasives Co.	1162
Clementina Limited	609
Cleveland Punch & Shear Works Co.	1739
Climax Molybdenum Co.	421
Coast Metals, Inc.	1907
Coated Coil Corp.	1630
Cold Metal Products Co.	338
Coles Cranes, Inc.	1387
Commercial Filters Corp.	1419
Consolidated Industries, Inc.	963
Consolidated Vacuum Corp.	836
Continental Industrial Engineers, Inc.	1701

ROTO FINISH
your new opportunity in
controlled precision finishing
Roto-Finish processes are controlled precision finishing operations using low cost mass production techniques, which maintain exact tolerances on most any size or shape precision part with no significant dimensional changes. Roto-Finish speeds production, cuts maintenance expense, minimizes operational costs, yet produces top quality finishing results. Roto-Finish offers latest in controlled methods, materials and special purpose fixture equipment. Roto-Finish is your new opportunity in controlled precision finishing with guaranteed results!
Write for catalog today! Ask about free Lab Testing Plan.

Roto-Finish

ROTO FINISH

COMPANY

3712 Milham Road, Kalamazoo, Michigan

P. O. Box 988
Phone 3-5578

METAL SHOW EXHIBITORS

	Booth
Cooper Metallurgical Assoc.	2048
Copperweld Steel Co.	310
Crane Packing Co.	1567
Crowley Boiler Works, Inc., John	2116
Cushman & Denison Mfg. Co.	2246
Cyclops Div.	1520
Day Engineering Co., Inc.	1671
Delaware Tool Steel Corp.	1933
Delta Power Tool Div.	1530
Detrex Corp.	1205
Detroit Testing Machine Co.	545
DeVilbiss Co.	751
Diamond Machine Tool Co.	2124
Diesel Power, Inc.	2150
Dings Magnetic Separator Co.	2132
Disston & Sons, Inc.	1753
Diversey Corp.	844
Dodge Steel Co.	1443
Drever Co.	1972
Driver Co., Wilbur B.	515
Driver-Harris Co.	534
Drop Forging Assn.	1278
Dumore Co.	1539
du Pont de Nemours & Co., Inc., E. I.	1457
East Shore Machine Prod. Co.	1756
Eastern Overall Cleaning Co	1368
Eaton Mfg. Co.	1533
Eddystone Div.	1954
Electric Arc, Inc.	1650
Electric Furnace Co.	334
Electro-Alloys Div.	352
Electro Arc Sales Co.	2242
Electro Circuits, Inc.	2210
Electro Dynamic Div.	951
Elox Corporation of Mich.	1027
Empire Products, Inc.	1827
Enamelstrip Corp.	1630
Engelberg Huller Co.	1073
Engineered Castings Div.	352
Engineered Precision Casting Co.	1269
Ercona Camera Corp.	2036
Eriez Manufacturing Co.	1917
Eutectic Welding Alloys Corp.	1225
Exomet, Inc.	2128
Fab-Alloy Co. Div.	2116
Fairchild Engine and Airplane Corp.	1808
Falstrom Co.	651
Fawick Airflex Div.	507
Fawick Corp.	507
Fenway Machine Sales Co.	2247
Firth Sterling, Inc.	740
Foxboro Co.	1377
Franklin Control Corp.	2165
Gas Appliance Service, Inc.	1932
Gas Machinery Co.	1942
Gasway Corp.	1477
General Alloys Co.	204
General Dynamics Corp.	951
General Electric Co. (apparatus)	1572
General Electric Co.	1540
General Electric Co. (x-ray)	660
General Motors Corp.	945
General Ultrasonics Co.	1063
Globe Steel Abrasive Co.	1162
Goodrich Co., B. F.	641
Graham Mfg. Corp.	2031
Grand Specialties Co.	101
Green Instrument Co.	2148
Gries Industries, Inc.	240
Gries Reproducers Corp.	240
Griffith-Raguse & Co., Inc.	1727
Gulf Oil Corp.	1414
H & H Research Co.	1051
Hacker & Co., Inc., William J.	1372
Hammond Machinery Builders, Inc.	1453
Harnischfeger Corp.	1657
Harper Electric Furnace Corp.	1815
Harshaw Chemical Co.	139
Harshaw Scientific Div.	139
Hauch Manufacturing Co.	1921
Haveg Corp.	2055
Haynes Stellite Co.	1375
Heatbath Corp.	1362
Heintz Mfg. Co.	1758
Heli-Coil Corp.	617
Hevi Duty Electric Co.	808
High Vacuum Equipment Corp.	817
High Voltage Engineering Corp.	625
Hitchiner Manufacturing Co., Inc.	926

FOUND [illegible]HERE WORLD FAMOUS AIRCRAFT ARE "BORN"

GRAND RAPIDS GRINDERS

Grand Rapids No. 55 Hydraulic Feed Surface Grinder
This precision tool room type machine Table speed up to 125 fpm. Working surface of table is 12" x 36". Vertical movement of wheel head 18". Preloaded ball bearing spindle greased for life. Spindle speeds 1925 and 2500 rpm.

Just take a look in their toolrooms! Every one of these famous aircraft manufacturers uses Grand Rapids Grinders . . . engineered and built for unusual long life of precision grinding. Our Model 55 shown here, for instance, features column and base of massive, one-piece casting for vibrationless rigidity and permanent alignment. Both longitudinal table travel and cross feed are hydraulically actuated. Wheel head has powered rapid vertical travel. Table speed is variable up to 125 fpm . . . faster than any other of this type and size.

That's why so many tool room men insist on Grand Rapids Grinders.

Just a note on your letterhead will bring you full details.

GALLMEYER & LIVINGSTON

GALLMEYER & LIVINGSTON COMPANY 400 Straight Ave., S.W., Grand Rapids, Mich.

Designed and built by

UNITED

4-HIGH 2-STAND TANDEM BRASS MILL

UNITED

ENGINEERING AND FOUNDRY COMPANY

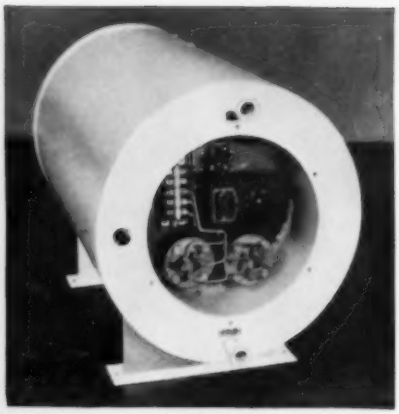
PITTSBURGH, PENNSYLVANIA

REG. T. M.

Plants at: PITTSBURGH • VANDERGRIFT • YOUNGSTOWN • CANTON
WILMINGTON (LOBDELL UNITED DIVISION)

Subsidiaries: ADAMSON UNITED COMPANY, AKRON, OHIO
STEDMAN FOUNDRY AND MACHINE CO., INC., AURORA, INDIANA

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other Heavy Machinery. Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.



ABOVE: A completed Hubbell booster water heater.

LEFT: Welding the head on a 10-gallon Everdur booster heater tank using Anaconda ¼" Everdur-1010 Rod. All spuds, flanges and fittings are Everdur.

Everdur tanks...welded with Everdur-1010 rod make long-life booster water heaters

Water at 180F may be highly corrosive. Yet 180-degree rinse water is required by many sanitary codes for sterilization in commercial dishwashing machines.

The Electric Water Heater Co. of Stratford, Conn., makers of Hubbell water heaters, and one of the pioneers in the electric water heater business, builds 10-gallon and 20-gallon models for just this service. Experts in the design and fabrication of water heating equipment, Electric Water Heater Company is also a pioneer in the use of Everdur* for its tanks.

The tinned Everdur tanks for booster heaters are welded by the carbon-arc method, using Everdur-1010 Welding Rod. In this tough service in restaurants, hotels, schools and institutions, the tanks have performed dependably and are considered to have a long life expectancy.

AnacondA Welding Rods for many types of welding are available from distributors throughout the United States and Canada. See your distributor for help in selecting the exact rod to help you speed assembly and cut production costs. Or write for Publication B-13. Address The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

*Reg. U. S. Pat. Off. 55125

braze or weld with confidence

ANACONDA®

welding rods

You can select from

9

ANACONDA welding rods

NAME OF WELDING ROD	APPROX. MELTING POINT. DEGREES Cent.	Fahr.	USUAL APPLICATIONS
*ANACONDA COPPER-372 (Patent No. 2,220,464)	1075	1967	Inert-gas arc and oxyacetylene welding of copper.
TOBIN BRONZE-481	885	1625	Oxyacetylene braze welding of steel, cast iron, and copper alloys.
ANACONDA-997 (Low-Fuming) BRONZE	870	1598	A low-fuming manganese bronze for use where the highest weld metal properties are required. Oxyacetylene braze welding of steel, cast iron, and copper alloys, and for bearing surfaces.
NICKEL SILVER-828	930	1706	Oxyacetylene braze welding of cast iron and steel for strong, color-matching welds and bearing surfaces.
CUPRO NICKEL-826 (Patent No. 2,012,450)	1225	2237	Oxyacetylene welding of Cupro Nickel and surfacing of steel.
*EVERDUR-1010	1019	1866	Inert-gas arc, carbon-arc and oxyacetylene welding of Everdur, copper and copper alloys. Also for welding to, and for surfacing steel.
*PHOSPHOR BRONZE-351	1050	1922	Inert-gas and carbon-arc welding of phosphor bronze and copper, and for surfacing steel.
*PHOSPHOR BRONZE-354	1000	1832	Inert-gas and carbon-arc surfacing of steel, and for welding phosphor bronze.
**AMBRALOY-928	1040	1904	Inert-gas consumable-electrode welding of aluminum bronze and for surfacing steel.

*These alloys are also used in the inert-gas consumable electrode process. Spooled rods are marketed by the manufacturers of the welding equipment.

**Supplied only on spools by the manufacturers of the welding equipment.

EXHIBITORS

	Booth
Hobart Brothers Co.	1020
Holger Andreasen, Inc.	961
Hones, Inc., Charles A.	1804
Houghton & Co., F.	724
Howard Foundry Co.	208
Illinois Testing Laboratories	919
Induction Heating Corp.	1242
Industrial Heating Equipment Co.	621
Industrial Launderers Assn. of Pa.	1368
Industrial Products Suppliers	958
Industrial Research Lab., Inc.	2053
Industrial Techtonics, Inc.	835
Instron Engineering Corp.	1415
International Nickel Co., Inc.	309
Ipsen Industries, Inc.	420
Iron Age, The	1862
Ivy Co.	1949
Janney Cylinder Co.	1263
Jarrell-Ash Co.	344
Jiffy Tool Supply Co.	2140
Johnson Co., Eric S.	1340
Johnson & Son, Inc., S. C.	750
Jomac, Inc.	1070
Kasson Die & Motor Corp.	1277
Kearney & Trecker Corp.	1450
Kelite Corp.	2019
Kemp Mfg. Co., C. M.	1801
Kencliff Corp.	2062
Kent Cliff Laboratories Div.	1055
Kerns Co., L. R.	1250
King, Andrew	320
Kinney Manufacturing Div.	1171
Knight Models, Inc.	1860
Kolcast Industries, Inc.	1561
Krouse Testing Machine, Inc.	1880
Laboratory Equipment Corp.	2159
Lake Chemical Co.	506
Lapeer Mfg. Co.	706
Leeds & Northrup Co.	1822
Leitz, Inc., E.	1071
Lempco Products, Inc.	560
Lepel High Frequency Labs., Inc.	1256
Lincoln Electric Co.	231
Linde Air Products Co.	1375
Lindberg Engineering Co.	230
Lindberg Industrial Corp.	230
Lithium Co.	1901
Lord Chemical Corp.	1059
Los Angeles Dept. of Water & Power	1977
Lufkin Rule Co.	805
Lynchburg Foundry Co.	709
Machlett Laboratories, Inc.	2049
Magnaflux Corp.	446
Magnethermic Corp.	1740
Magnetic Analysis Corp.	2024
Malayan Tin Bureau	1772
Man-Au-Cycle Corp. of America	1159
Manco Mfg. Co.	1471
Manganese Steel Forge Co.	1850
Markal Co.	506
Marsh Stencil Machine Co.	2147
Mead Specialties Co.	1872
Merrill Bros.	1354
Metal Improvement Co.	2239
Metal Products Sales Co.	926
Metal & Thermit Corp.	153
Metallizing Co. of America	2061
Metallurgical, Inc.	218
Metals & Controls Corp.	1440
Metalwash Machinery Corp.	1924
Metlab Co.	1047
Minnesota Mining & Mfg. Co.	1668
Mitchell Radiation Products Corp.	2016
Modernair Corp.	959
Mullins Mfg. Corp.	918
Naresco Equipment Corp.	1577

PRESTO! It's Perforated—
Hendrick
Ornametal

You'll be surprised how Hendrick Perforated Ornametal fabricated into products can add a magic touch to sales . . . Today, more and more designers keep a copy of Hendrick's Ornametal catalog close to their drawing board. The reason is plain—Hendrick Ornametal dresses up and adds sales appeal to product appearance. Whatever your needs be if you design or sell radiator enclosures, stoves, lockers, furniture or any appliance, you can rest assured there's a Hendrick Ornametal design suited to your needs. For more complete details on how Hendrick can help your profit picture call your nearby Hendrick representative today.

Hendrick
MANUFACTURING COMPANY

37 DUNDAFF ST., CARBONDALE, PA. • Sales Offices in Principal Cities
Perforated Metal • Perforated Metal Screens • Wedge-Slot and Wedge Wire
Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids

SAVE $155 PER TON with MicroRold® 430 Stainless Steel

7¾¢ Per Lb. Price Differential Between Types 430 and 302 Results In This Substantial Savings

By specifying MicroRold Type 430 stainless steel for suitable applications, stainless steel buyers can take advantage of the 7¾¢ per pound difference in price between Type 430 and Type 302 stainless. A saving of $155 per ton merits consideration. Type 430 is a straight chromium-stainless with a nominal composition of 17% Chromium. During the Korean conflict, Type 430 was used extensively, due to government restriction on nickel-bearing stainless.

WIDE USE FOR TYPE 430

While Type 430 does not possess the same degree of corrosion resistance as Type 302, it has proven very satisfactory in a wide range of mild corrosion applications, both interior and exterior. It lends itself to a multitude of decorative and functional uses combining all the advantages and qualities of stainless steel—beauty, strength, corrosion resistance, long life, workability and ease of maintenance. Considering the price advantage, with no sacrifice in quality when applied properly, stainless steel buyers will find MicroRold Type 430 a worthwhile material for an impressive number of stainless steel applications.

Washington Steel
Corporation

WASHINGTON PENNSYLVANIA

RENT OR BUY
SILENT HOIST
LIFTRUK
on the
"DAY-BY-DAY EARN-ITS-WAY PLAN"

3-5-7½-10-15 ton CAPACITIES

***Exclusive-* FLUID DRIVE**

If you can reasonably use a Heavy Duty LIFTRUK for at least two hours a day average, to improve the movement of goods in process or reduce materials handling operations, then you should be interested in this unusual "rent-or-pay-as-you-use" plan. Proper cost accounting methods often show that man-hours saved, storage space gained, or time in transit reduced, add up to a profit well above the payments required for LIFTRUK for purchase or rental charges.

Write for "Earn-Its-Way" Plan to

SILENT HOIST & CRANE CO.
Pioneer Mfrs. of Heavy Duty Materials-Handling Equipment
851 63rd Street, Brooklyn 20, N. Y.

	Booth
National Carbon Co.	1375
National Cored Forgings Co., Inc.	431
National Lead Co.	130
National Precision Casting Corp.	1768
National-U. S. Radiator Corp.	1330
National Research Corp.	1577
National Spectrographic Labs., Inc.	540
National Torch Tip Co.	2149
National Welding Supply Assn.	1961
Nelco Tool Co., Inc.	1163
New Hermes Engraving Machine Corp.	1273
New Standard Div.	1374
New York Air Brake Co.	1171
Nibbler Co., G. V.	2167
Nord International Corp.	1257
North American Philips Co., Inc.	1154
Nuclear Research Corp.	1857
Oakite Products, Inc.	1767
Ohio Crankshaft Co.	1509
Olin Mathieson Chemical Corp.	524
Olsen Testing Machine Co., Tinius	1428
Osborn Mfg. Co.	718
Optical Film Engineering Co.	1067
Pangborn Corp.	1032
Pantex Mfg. Corp.	2015
Park Chemical Co.	330
Parker Rust Proof Co.	1549
Pedrick Tool & Machine Co.	741
Peerless Electric Co.	1155
Pendergast Safety Equipment Co.	2054
Pennsylvania Salt Mfg. Co.	1272
Philadelphia Electric Co.	1262
Phillips Mfg. Co.	512
Phoenix Products Co.	1672
Pioneer-Central Div.	1525
Pittsburgh Crushed Steel Co.	1162
Plastic Metals Div.	1330
Platecoil Div.	1777
Pneuma-Serve, Inc.	640
Powdered Metal Products Div.	1557
Precision Metalsmiths, Inc.	1761
Precision Tube Co.	1167
Pressco Casting & Mfg. Corp.	2028
Production Machine Co.	1339
Pyrofax Gas Corp.	1375
Pyrometer Instrument Co., Inc.	1439
Ransburg Electro-Coating Corp.	1983
Ransohoff, Inc., N.	1608
Reed-Prentice Corp.	602
Reeves Pulley Co.	445
Reid-Avery Co., Inc.	1519
Reliance Div.	1533
Riehle Testing Machines Div.	149
Rockwell Manufacturing Co.	1530
Rolle Mfg. Co., Inc.	1620
Ryerson & Son, Inc, Joseph	931
S & S Machinery Co	1159
Sall Metals Co, Inc., George	1062
Schrader's Son Div., A.	1458
Sciaky Bros., Inc.	946
Scientific Electric	1279
Scott Paper Co.	915
Seal Cast Co., Inc.	2153
Selas Corp. of America	1601
Sentry Co.	635
Service Diamond Tool Co.	2135
Service Machine Co.	1640
Service Machine Co.	1358
Sharon Steel Corp.	1719
Shell Oil Co.	1749
Shenango-Penn Mold Co.	650
Sieburg Industries	1876
SKIL Corp.	1980
Smith Corp., A. O.	1842
Smith Welding Equipment Corp.	1714

EXHIBITORS

	Booth
Socony Mobil Oil Co., Inc.	1350
South Chester Corp.	1445
South Florida Test Service	2215
Special Libraries Assn.	123
Spee-Flo Co.	2012
Spencer Turbine Co.	1946
Sperry Products, Inc.	1320
Stanat Mfg. Co.	1355
Standard Die Set Mfrs., Inc.	1675
Stanley Electric Tool Div.	2123
Starrett Co., L. S.	1720
Steel City Testing Machines, Inc.	324
Steel Shoe Producers, Inc.	1162
Stimpson Co., Inc., Edwin B.	411
Stock, Inc., Alvin M.	1757
Stokes Machine Co., F. J.	1302
Stone Machinery Co., Inc.	551
Sun Oil Co.	922
Superior Tube Co.	1470
Surface Combustion Corp.	304
Swan-Finch Oil Corp.	1662
Swift Industrial Chemical Co.	1975
Symington-Gould Corp.	1054
Tapmatic Corp.	1340
Taylor Dynamometer & Machine Co.	965
Taylor Instrument Co's.	966
Technical Operations, Inc.	2023
Tech-Pacific	2167
Tempil Corp.	1533
Texas Co.	734
Thomson Electric Welder Co.	971
Thor Power Tool Co.	731
Tickle Engineering Works, Inc.	1808
Timesavers, Inc.	2250
Tin Research Institute, Inc.	439
Tinnerman Products, Inc.	1467
Titan Metal Mfg. Co.	341
Titanium Metals Corp. of America	624
Tocco Div.	1509
Torit Mfg. Co.	1454
Torsion Balance Co.	1055
Townsend Co.	1371
Tranter Mfg., Inc.	1777
Triplett & Barton, Inc.	254
Tubular Micrometer Co.	950
Turco Products, Inc.	1319
Union Carbide & Carbon Corp.	1375
United Scientific Co.	2040
United Shoe Machinery Corp.	735
U. S. Electrical Motors, Inc.	1816
U. S. Expansion Bolt Co.	1374
U S. Plywood Corp.	1871
United Wire & Supply Corp.	2009
Universal-Cyclops Steel Corp.	1520
Universal Castings Corp.	1856
Upton Electric Furnace Co.	1867
Vacu-Blast Co., Inc.	811
Vanadium-Alloys Steel Co.	104
Vanadium Corp. of America	816
Versa-Mil Co.	1778
Vickers, Inc.	1771
Visioneering Co., Inc.	1829
Waldes Kohinoor, Inc.	1466
Wales-Strippit Corp.	1210
Walker-Turner Div.	1450
Waukee Engineering Co.	1239
Weatherhead Co.	717
Wells Manufacturing Corp.	730
Weltronic Co.	1955
Westfield Sheet Metal Works, Inc.	760
Westinghouse Electric Corp.	1510
Wheelco Instruments Div.	809
Whitehead Metal Products Co., Inc.	1344
Wilson Mechanical Instrument Div.	1044
Yale & Towne Mfg. Co.	1557
Ziess, Inc., Carl	2036

PUNCHES·DIES

RIVET SETS · COMPRESSION RIVETER DIES

Made of highest standards and uniform quality thus insuring maximum service.
Since 1903

Large inventory of stock sizes of round punches and dies, also rivet sets available for immediate shipment. Square, rectangular, oblong and elliptical shapes made to order.

Write Dept. B for New Catalog 54

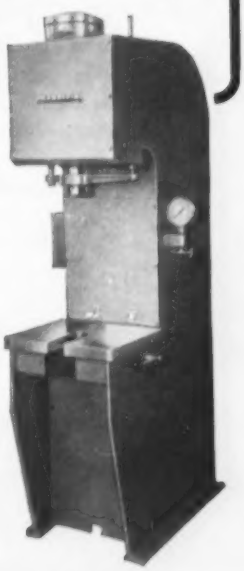
GEO. F. MARCHANT COMPANY
1420-34 So. ROCKWELL STREET · CHICAGO 8, ILLINOIS

PRICE LIST

ON HANNIFIN STOCK HYDRAULIC PRESSES

1-TON	$ 552
2-TON	$ 627
5-TON	$1,286
8-TON	$1,581
10-TON	$1,855
25-TON	$3,681

Prices complete with motors and starters F.O.B. our press plant, St. Marys, Ohio, subject to change without notice.



DELIVERY FROM STOCK

Demand for these popular presses is so consistent we are able to produce them in quantity and pass the savings along to you.

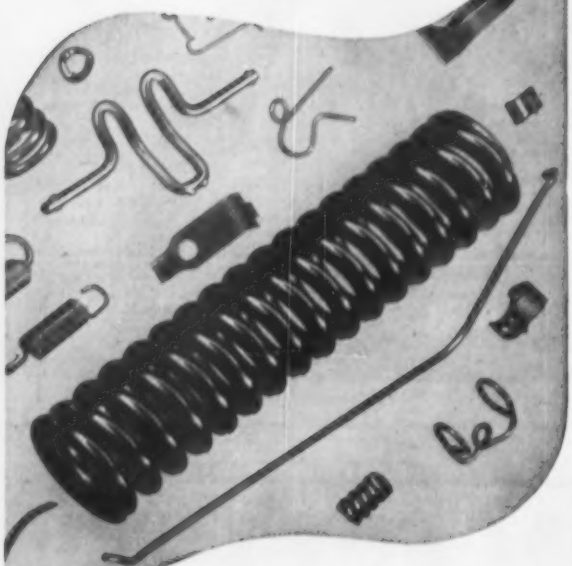
Construction-wise and quality-wise these small general-purpose presses are identical to the larger Hannifin presses, up to 150 tons. Special, optional controls when needed.

WRITE for complete information on the Hannifin Hydraulic Press you're interested in.

HANNIFIN

HANNIFIN CORPORATION, 513 S. WOLF ROAD, DES PLAINES, ILLINOIS

COIL SPRING SAYS:



The way to keep costs low on springs is to use modern mass production equipment and employ skilled specialists who know all the ins-and-outs of spring production. That's why U. S. Steel Wire Spring has consistently invested in more efficient machinery and skilled personnel. If *you're* looking for a way to keep the lid on costs of springs, wire forms and small parts, why not call U. S. now!

No order too large or too small!

The U. S. STEEL WIRE SPRING Co.

7800 FINNEY AVE. • MICHIGAN 1-6315

CLEVELAND 5, OHIO

IVY MULTI-RANGE FATIGUE TESTING MACHINES

Model IVY-12*

*(below) Model BJL-1 Dynamic Creep Tester**

The IVY Company presents a standard line of constant force fatigue testing machines ranging in capacity from 200 to 120,000 lbs., featuring large dynamic amplitude through use of torque bar springs and exclusive Multi-Range System.

New IVY dead-weight method maintains constant static force mechanically on smaller machines—provenly accurate and stable electronic IVY-PIC Controller* used on larger models. IVY also announces its fully automatic Program Controller* which follows and repeats any predetermined dynamic load "intensity-duration" spectrum — unit available in any number of stations for any machine.

The IVY BJL-1 Dynamic Creep Tester* is an industrial version of a proven machine developed in a well-known university laboratory. Specimen alignment is simplified by the special fixture supplied. High temperature Extensometer* available as extra with fixture.

***In operation at the NATIONAL METALS SHOW—BOOTH 1949**

IVY Engineers will gladly discuss your individual fatigue and vibration testing problems—Dept. IA-10.

THE IVY COMPANY NORWALK, CONNECTICUT

New HILL ACME BAR SHEAR BILLET

This new BAR-BILLET shear has tremendous power and will cut rounds, flats, squares and special shapes without set-up changes. Clean, square cuts with a minimum of distortion, are guaranteed. Simplicity of design with fewer moving parts insures economical maintenance and the purchase price is LOW!

Designed and produced by HILL ACME with more than 50 years of experience in heavy duty metal working machinery. Bulletin LLB gives complete details — send for it today!

SIZE 4½

The HILL ACME Co.

"CANTON" DIVISION

6404 Breakwater Ave. • CLEVELAND 2, OHIO

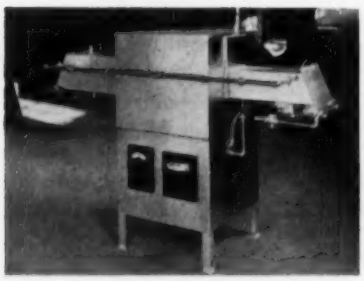
NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies . . . for more data use the free postcard on page 237 or 238

Machine for industrial compacting operations

A 10-ton high-speed rotary tablet machine, Model 533, can turn out up to 2500 tablets per minute and handle a variety of industrial compacting operations, including ceramics, powder metals and plastics preforming. The press comes in two versions. One, with 33 stations, can make tablets to 1-1/16 in. diam and 1⅛ in. depth of fill, at rates from 900 to 2500 per minute. The other, with 27 stations, can make tablets to 1-3/16 in. diam and 1⅜ in. depth of fill at rates from 700 to 2000 per minute. Features of the machine include automatic, gear-operated lubrication, which provides oil under pressure to all vital points in the machine where wear could occur. The machine is claimed to be the lowest in floor space requirements of any rotary machine on the market. Dial-type tachometers indicate production directly in tablets per minute. Pressure indicators, graduated in tons, are provided. *Stokes Machine Co., Inc.*

For more data circle No. 26 on postcard, p. 237.



Electric furnace for sintering metal powder

An electric sintering furnace is designed for controlled atmosphere work in sintering powdered metals, either ferrous or nonferrous, brazing, bright annealing and for many specialized applications in metallurgy, ceramics, etc. Units or products to be heat treated are placed on suitable plates or trays and manually pushed through the successive temperature zones. Mechanical pusher systems can be supplied optionally with pusher speeds as low as 0.03 ipm in the smaller sizes. Radiation baffles may be adjusted to conform to size or type of product being treated. *Pereny Equipment Co.*

For more data circle No. 27 on postcard, p. 237.

Truck leveling device conserves space

Called Adjust-A-Truck, a new adjustable truck leveling device is intended for space-conserving applications where conventional dock leveling devices cannot be used. It is built into the pavement in front of a loading dock. A heavy-duty hydraulic system raises or lowers the truck or trailer bed to the level of the dock. Capacity is 40,000 lb. Standard units measure 12-ft long by either 9 or 10-ft wide. Ramp is positioned by push button control in a matter of seconds. *Rowe Methods, Inc.*

For more data circle No. 28 on postcard, p. 237.

Powered dumpers for simpler handling

Three basic models of a new line of dumping hoppers are offered. Model 54 PowRdumper is for front dumping and is for use with loads to 750 lb. It lifts up to 8 ft. Model 36 is for front dumping for loads over 750 lb, to any dumping heights. Model 32 is for side dumping and can handle loads from 2000 lb up, to any dumping heights. The dumpers are for raising drums, barrels, bags, boxes or other type containers, then turning them to any desired dumping angle and discharging contents without spilling. *Langley Mfg. Co., Inc.*

For more data circle No. 29 on postcard, p. 237.

Turn Page

Chobert®
Patented

AUTOMATIC RIVETING increases production—cuts costs for MOTOROLA TV!

1. Insert rivet, automatically held ready by mandrel and jaws of Chobert riveter, into proper size hole.
2. Press trigger of pneumatic riveter. Mandrel draws back expanding rivet to uniform upset and tightness in one complete operation. Next rivet is automatically readied by Chobert riveter for use.
3. Solid, finished rivet is gas and watertight. Can be used without sealing pin!

SOLVES ALL HARD-TO-GET-AT RIVETING PROBLEMS!

Motorola TV cabinet assembly problems requiring rivet fasteners in difficult blind applications were completely solved with the Chobert High-Speed Riveting System. Proper fastening, faster production and direct savings resulted.

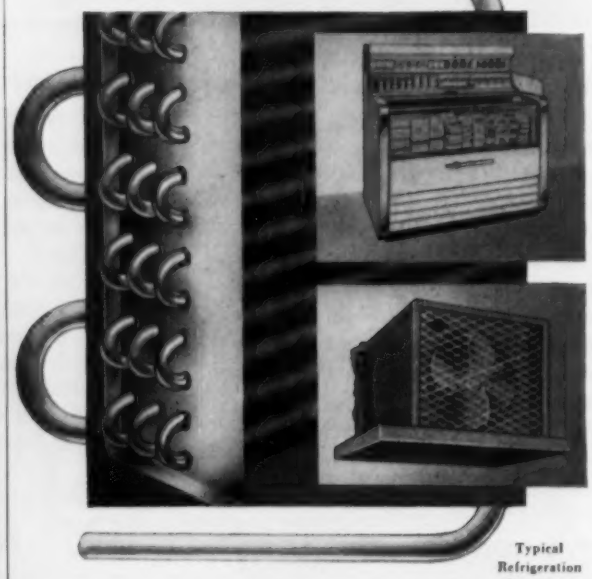
No skilled help is needed with the Chobert system. Quantity loading, fully-automatic riveting with uniform results at the press of the trigger, blind or open riveting, completed from one side of the work, and many other Chobert features are worth your investigation!

Write for free Chobert brochure—TODAY!

Chobert
AVIATION DEVELOPMENTS INC.
Chobert—Reg. U. S. Pat. Off.
210 SOUTH VICTORY BLVD. BURBANK, CALIFORNIA

AVIATION DEVELOPMENTS (CANADA) LTD., TORONTO,
AVIATION DEVELOPMENTS LTD., LONDON, ENGLAND

Wherever You Find *United* Copper Tubing.



Typical Refrigeration Evaporator Applications

You Find *Confidence* in Performance!

In refrigeration or whatever the job is you have for copper tubing, you can depend on the precision quality of United Mill products. The difference is production control and processing.

Compare United quality and prompt deliveries. You get quality plus . . . including close tolerances, uniform temper and good clean outside and inside surfaces.

It costs no more to get the best copper tubing.

UNITED WIRE & SUPPLY CORPORATION
Providence 7, R. I. • Offices in Principal Cities

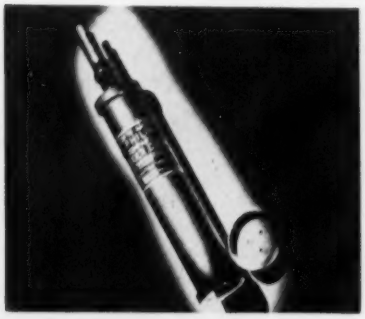
UNITED COPPER TUBING
"first in quality"
Permanently United

Electric fork trucks built for maneuverability

The new Model FT line of electric fork trucks has been designed especially for high maneuverability, ease of maintenance and increased operator comfort. Line includes trucks with 3000, 4000, and 6000-lb capacities. Trucks have low center of gravity, increased width and low overhang for high stability, yet turning radius for the 3000-lb truck is only 73½ in. Minimum intersecting aisle is 66½ in. and clearance for right-angle turn is 87 in. exclusive of load length. Trucks have three braking systems. Wheel brakes are hydraulic, self-energizing and self-equalizing, and are adjustable without removing the wheels. The parking brake, actuated by spring seat, acts on the armature shaft. Trucks also have dynamic braking, with a feature preventing abrupt reversal of direction while truck is in motion. Truck cannot be started except in first speed. *Baker-Raulang Co.*

For more data circle No. 30 on postcard, p. 237.

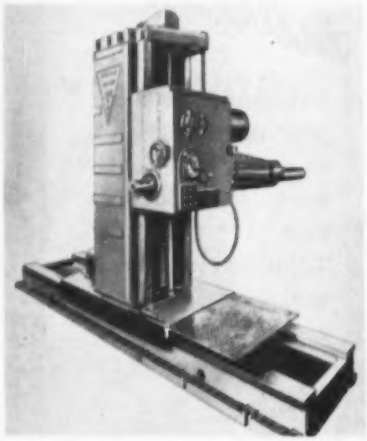
New unit for x-ray spectrographic work



Designed for x-ray spectrographic work, a new Geiger-counter tube has a resolving time of approximately 150 microseconds. Threshold is approximately 800 v. Slope of plateau is 10 pct maximum and the end of the plateau is over 1100 v. Slope depends on counting rate and electronic measuring circuits. The 10 pct figure is based on a rate of 100 counts per second at a sensitivity of 1 v. Operating potential is 900 v. Background with 2-in. of lead shielding is 75 counts per minute maximum. Operating temperature range is −55°C to +75°C. Life is not limited by use. *Research & Control Instruments Div., North American Philips Co., Inc.*

For more data circle No. 31 on postcard, p. 237.

Drilling-boring machine has 5-in. diam spindle



Designed specifically for large drilling, reaming, boring, tapping and spot facing operations with modern cutting tools, this new and larger size Kaukauna Model 3045 has a 5-in. diam nitralloy spindle providing 42 in. of continuous spindle travel under power feed, and a positive drive employing motors up to 25 hp. Extreme accuracy is obtained from the machine by mounting the spindle in a hardened forged sleeve set in precision Timken taper roller bearings. All controls are located for maximum convenience at the extreme front face of the headstock within easy reach of the operator. Speed and feed changes are made automatically and are selected by rotating a dial. Tool location is secured by a two-speed traverse mechanism controlled by pushbutton which gives rapid traverse at 100 in. per minute and positioning traverse at 4 in. per minute. Automatic lubrication is provided for proper operation of the entire machine. *Kaukauna Machine Corp.*

For more data circle No. 32 on postcard, p. 237.

Variable-speed pulley fits small space

A ¼ hp variable-speed pulley for limited space applications is designed so that it can be mounted with the belt takeoff close to the motor or reversed, to have belt takeoff in an overhung position away from the motor. Speed ratios up to 2 to 1 are provided. An A section belt is used. Maximum bore is ⅝ in. with keyway. Smooth belt surfaces reduce belt wear, make for quieter operation. Bronze oil-impregnated bearings eliminate need for lubrication for the life of the pulley. However, a pressure lubrication grease fitting is provided on the open end of the bore with grease channels running to the bearing surfaces for applications demanding lubrication. Overall dimensions are 3-5/16 in. length by 3 in. diam. Weight is 26 oz. *Lovejoy Flexible Coupling Co.*

For more data circle No. 33 on postcard, p. 237.

Turn Page

Tempilstik°

FOR ALL HEAT-DEPENDENT OPERATIONS

looks like a crayon...

marks like a crayon...

tells temperatures like a precision instrument!

Sixty-three different compositions enable you to determine and control working temperatures from 113° to 2000° F. TEMPILSTIK° marks on workpiece "say when" by melting at stated temperatures—plus or minus 1%.

ALSO AVAILABLE IN LIQUID AND PELLET FORM . . . WRITE CUSTOMER SERVICE DEPT. FOR SAMPLE TEMPIL° PELLETS . . . STATE TEMPERATURES OF INTEREST—PLEASE!

Tempil°
CORPORATION
132 WEST 22ND STREET
NEW YORK 11, N. Y.

Visit us at Booth 1533 . . . Oct. 17-21
Nat'l Metal Exposition . . . Philadelphia

NEW EQUIPMENT

Numerically controlled

Completely controlled by a punch tape, this turret lathe is automatically cycled and provides rectilinear motions with precise controls to the end points. The tape controls spindle speed (choice of 32 speeds); indexing of the 6 position turret to any face at any time; operation of hydraulic powered collet chuck end bar feed; turning

coolant on or off; opening or closing hood; resetting of tape to repeat cycle. Tools are preset to gages for a given dimension. The machine reduces setup time and necessity for skilled operators; is suitable for short run jobs; makes single piece production feasible. *Jones & Lamson Machine Co.*

For more data circle No. 34 on postcard, p. 237.

Sequence valves

Series 4000 slide-type sequence valves for 3000 psi hydraulic service feature extremely low leakage and low pressure drop. Stock models have a standard maximum internal leakage of 15 drops per minute. Special models with maximum leakage rates as low as 5 drops per minute are available. Valves have a fully-balanced, self-cleaning spool which is selectively lapped into a rigid sleeve. The design provides a pressure-drop

claimed to be only ⅓ that found in conventional valves of this type. Supplied in plunger or lever-operated models. *Aircraft Products Co.*

For more data circle No. 35 on postcard, p. 237.

Turn Page

(Advertisement)

Important New Developments FROM THE CHEMICAL CORPORATION Research Laboratory

LUSTER-ON M

A new, quick *one dip* bright-clear treatment for zinc. Used in very dilute 2% solution to give a bright, attractive finish with good corrosion protection.

LUSTER-ON STAIN PREVENTIVE

For the large volume producer of zinc plating. A very economical finish for long shelf life. Suggested uses are on electrical conduits, outlet boxes, plated sheet stock, wire screening.

LUSTER-ON NL-C

A one dip bright conversion coating for cadmium requiring no leaching.

LUSTER-ON N5

The answer to "spotting out" troubles on copper and brass plate, especially under humid conditions. Is suitable for use on thin deposits. Improves clear lacquer adhesion.

LUSTER-ON ALUMINUM SEALER (222-M)

Produces a chromate film on aluminum that provides excellent corrosion protection and can serve as a paint base. Now can be dyed in many attractive pastel colors. Meets Government Spec. MIL-C-5541.

Ask for literature. Send a sample for free laboratory treatment.

Luster-on products are manufactured on the west coast by Crown Chemical and Engineering Co. of Los Angeles, Calif. and in the Dominion of Canada by Alloycraft Ltd. of Montreal, Quebec.

You'll also be interested in our Safety Division's line of industrial skin cleaners and protectors . . . protect your workers and your products. Literature available.

L-17

THE *Chemical* CORPORATION
79 WALTHAM AVE., SPRINGFIELD 9, MASS.

OLSON

MANUFACTURING COMPANY

100 PRESCOTT ST., WORCESTER 5, MASS.

Representatives: New York • Philadelphia

Screw Machine Products since 1913

1/8" to 2 5/8" CAPACITY

STEEL • BRASS • ALUMINUM

QUALITY . . . . . DEPENDABILITY . . . . . EXPERIENCE

NEW MORTON Shear-Weld-Trimmer

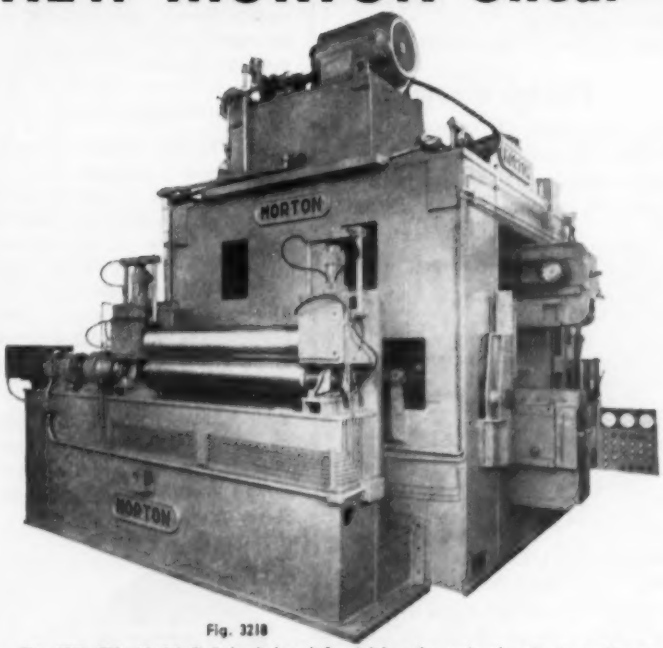


Fig. 3218

Fig. 3218. This Model R B is designed for joining the ends of coils in continuous process lines. Galvanizing, Pickling, Annealing and Slitting lines are some of the continuous processes requiring this Morton equipment.

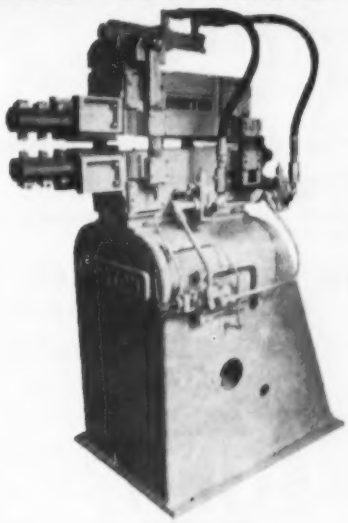


Fig. 4255

Fig. 4255. A light duty floor or bench type Trimmer having 4", 6" and 8" width capacity and 1/8" maximum metal thickness. Can be arranged for cylinders or strip trimming. When furnished with Morton Automatic Welding Equipment it is tops for many industrial applications.

MORTON MANUFACTURING COMPANY **Muskegon Heights, Michigan**

(Advertisement)

LABOR RELATIONS ?

O. W. Churchman

PRESIDENT • CINCINNATI GEAR CO.

That phrase "Labor Relations" has always bothered me. Personally I think it's the most misleading phrase in our language. Labor, to me, means hard, back-breaking toil, perhaps like the galley slaves of old — now that was really labor! We at Cincinnati Gear prefer a phrase like "Craftsmen-Management Relations."

After all, the men who work in our plant *are* craftsmen — skilled craftsmen of the highest order. We are managing the business — our skilled craftsmen are turning out the perfect gears that are the lifeblood of our business.

These men are important — we strive at all times to give them the finest machinery and the most pleasant working conditions possible. Craftsmen who have been with us five years or more are covered by a pension plan, with retirement benefits up to 30% of their regular monthly pay; our suburban location means a cleaner and more beautiful plant; color experts decided what color paints would be most conducive to a pleasant atmosphere inside our plant.

Our efforts have not been in vain — for over thirty years, when virtually every company had so-called "Labor" problems, production and pleasant relations at Cincinnati Gear continued as in the past.

No, we don't employ laborers at Cincinnati Gear — they are, and always will be, "Skilled Craftsmen!"

THE CINCINNATI GEAR CO.

CINCINNATI 27, OHIO

"Gears — Good Gears Only"

CINTI

Automatic lubricator

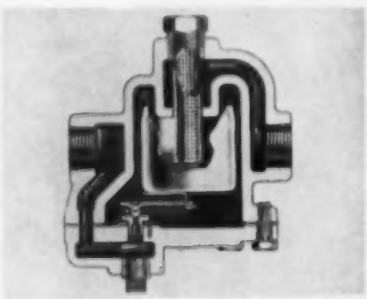
A compact automatic lubricator with a close-fitting ratchet drive provides centralized lubrication on small machines where a minimum of installation space is available. The cyclic type lubricator will feed controlled amounts of oil to as many as 25 bearing points. It is

powered by the machinery it lubricates, its adjustable ratchet being attached to a shaft from a convenient drive on the machine. An instant feed button can be actuated manually to provide a shot of oil regardless of ratchet setting. *Bijur Lubricating Corp.*

For more data circle No. 36 on postcard, p. 237.

Tighter steam trap

Better retention of prime under such difficult operating conditions as light loads, rapid pressure drops and partial vacuum in the return



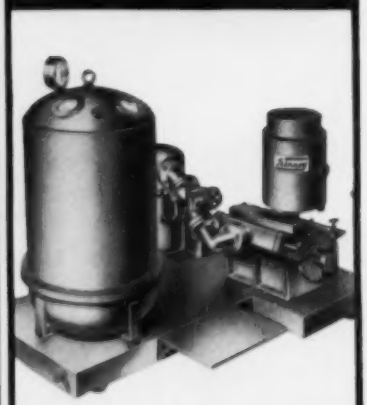
line caused by night shutdowns is claimed for a new inverted bucket steam trap. A camlift valve mechanism permits large discharge capacities and assures quick opening. *Sarco Co., Inc.*

For more data circle No. 37 on postcard, p. 237.

Turn Page

FROM VACUUM MELT DEGASSING . . .

Increased Production

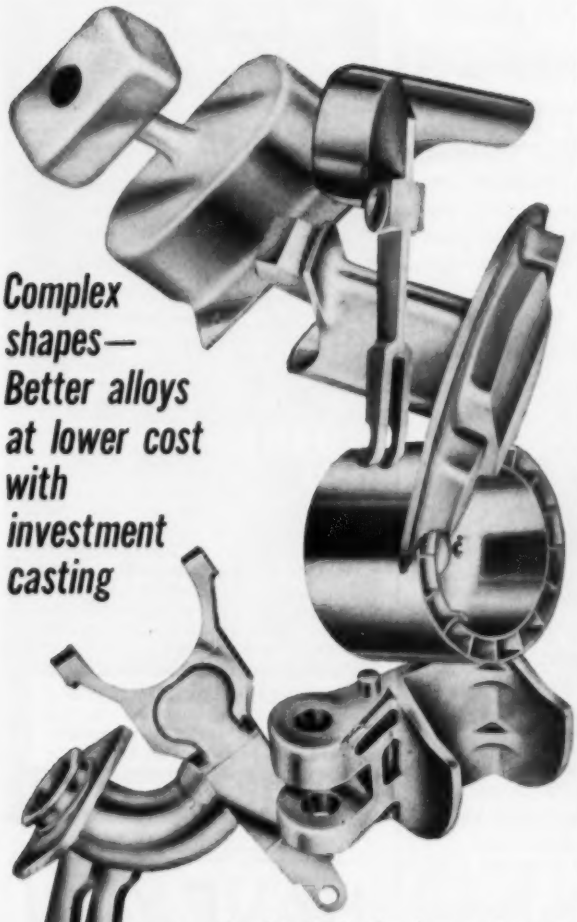


In the Kinney Portable Vacuum Degasser gaseous impurities are almost completely removed from melts. Metals and alloys are stronger, and tougher, and improved physical characteristics result in fewer rejections and greater production yields.

The Kinney Mobile Vacuum Degasser is a rugged, dependable, trouble-free unit designed for simple, economical foundry operation. The large vacuum chamber is equipped for easy melt control and observation. The Kinney KDH-130 vacuum pump provides the rapid pump-down to low pressures required for elimination of gaseous impurities.

Write today for Bulletin 402. Kinney Manufacturing Division, The New York Air Brake Company, 3634 Washington St., Boston 30, Mass.

Kinney



Complex shapes— Better alloys at lower cost with investment casting

Complete Design Freedom can be yours with investment casting. Ferrous and non-ferrous alloys including magnesium are cast with great detail, intricacy of shape and to close dimensions. Substantial Reductions In Production Costs are possible by reducing machining operations to the minimum.

- Assembly costs are cut by combining two or more components into an integral casting
- Large and small quantity production (including prototypes) are cast economically
- Tooling costs are relatively low

Arwood's four plants have complete tooling facilities and government approved inspection equipment.

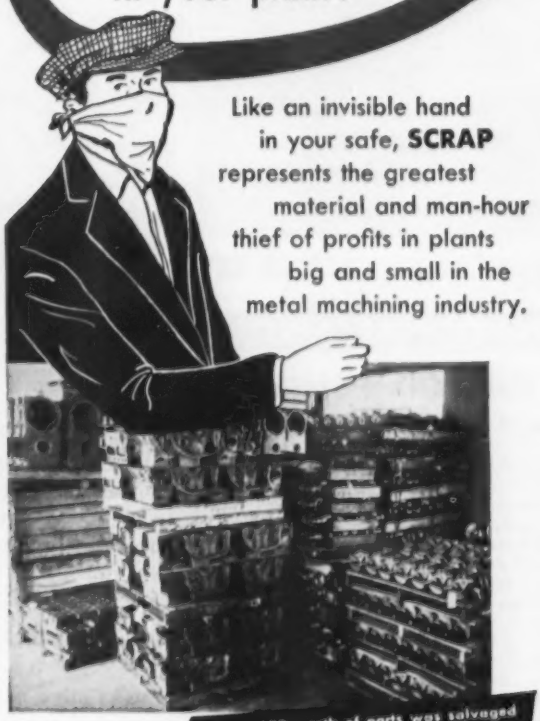
If you use metal in your business investigate the possibilities of investment casting . . . send for literature or call for consultation. We welcome parts or prints.

ARWOOD

PRECISION CASTING CORP.
67 Washington St. Brooklyn, N. Y.

PLANTS: Brooklyn, N. Y. • Groton, Conn. • Tilton, N. H. • Los Angeles, Calif.

there's a THIEF in your plant!



Like an invisible hand in your safe, **SCRAP** represents the greatest material and man-hour thief of profits in plants big and small in the metal machining industry.

This $5,000 worth of parts was salvaged at 12% of the original cost of parts

Working with plants throughout the country Elox found these interesting facts . . .

1. Some employees hide scrap
2. Some employees are afraid to report scrap
3. Some department heads won't admit the amount of scrap they actually have
4. Management didn't know how to solve the salvage problem

Today Elox equipped plants salvage 100% of scrap due to broken taps, drills, reamers, etc., profitably. Even on parts costing as little as 25c.

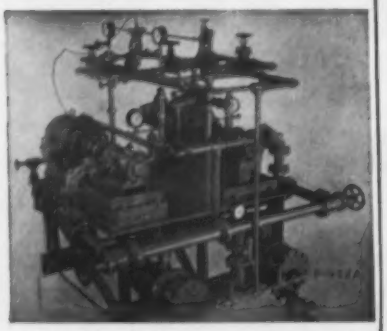
we can show YOU how!

elox *corporation of michigan*

726 N. Rochester, Clawson, Michigan

COMPLETE RANGE OF SIZES AND MODELS IN BOTH MEDIUM AND HIGH PRESSURE TYPES

MORE COMPACT than ever



P-952A—Steam Turbine and Electric Motor drive gives flexibility in this compact Model P-ES2H size No. 25 unit.

NATIONAL AIROIL

FUEL OIL PUMPING AND HEATING UNITS

NATIONAL AIROIL Fuel Oil Pumping and Heating Units are specially designed to prepare, for combustion, all grades of fuel oil including No. 6 or Bunker "C" Oil and residuums. They will draw fuel oil from above ground or underground tanks, preheat it to proper constant temperature and deliver it to Oil Burners at an even pressure, best suited for the burners. Our Fuel Oil Pumping and Heating Units are the result of years of experience. They come completely equipped ready for steam, exhaust, condensate, oil suction, oil return, and electrical connections. All valves, regulators, etc., are readily accessible. The piping arrangement is easily understood. These compact, space-saving units are available in a range of sizes and models in both Medium and High Pressure types. For complete details, write for our Bulletin 40—very interesting and informative.

OIL BURNERS and GAS BURNERS for industrial power, process and heating purposes
STEAM ATOMIZING OIL BURNERS
SLUDGE BURNERS, Steam Atomizing
MOTOR-DRIVEN ROTARY OIL BURNERS
MECHANICAL PRESSURE ATOMIZING OIL BURNERS
DUAL STAGE, Combining Steam and Mechanical Atomization
LOW AIR PRESSURE OIL BURNERS
AUTOMATIC OIL BURNERS for small process furnaces and heating plants
GAS BURNERS
COMBINATION GAS & OIL BURNERS
FUEL OIL PUMPING and HEATING UNITS
FURNACE RELIEF DOORS
OBSERVATION PORTS
SPECIAL REFRACTORY SHAPES

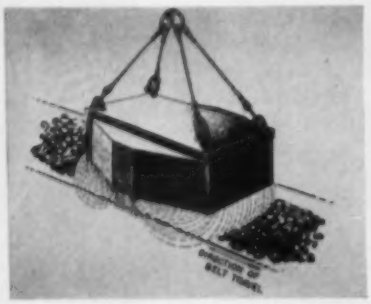
NATIONAL AIROIL BURNER CO., INC.

1271 East Sedgley Avenue, Philadelphia 34, Pa.
Southwestern Division:
2512 South Boulevard, Houston 6, Texas

NEW EQUIPMENT

Separation magnets

Rectangular electromagnetic separation magnets are designed for use in mines, quarries, foundries, smelters, etc., to remove tramp iron which might damage crushers and other equipment. The rectangular field of the Super Magnetomotive Magnets is specially designed for suspension over the head pulley or



in a horizontal position over a conveyor belt, by adjustable length cables. Arrangement of the center pole and two outer poles of the magnets provides a practically uniform high-Gauss field across the belt, for effective removal of tramp iron. *Ohio Electric Mfg. Co.*

For more data circle No. 38 on postcard, p. 237.

Thread-rolling machine

A two-die type, cylindrical die thread-rolling machine features a positive cam action to bring the dies to rolling position, and is suited for job shop operation as well as long production runs. It can be quickly changed over from one thread size to another and matching of dies is a simple process. The Model B 110 machine covers diameters to 2-in., and a wide range of production rates is possible. *The Reed Rolled Thread Die Co.*

For more data circle No. 39 on postcard, p. 237.

Industrial x-ray machine

An entirely self-contained, self-powered industrial x-ray machine can be operated anywhere on its own gasoline engine. Power and cooling assembly, master control, cable and hose reels are all contained in one package, which may be quickly moved to any location and set up for operation without any outside connection. *Triplett & Barton, Inc.*

For more data circle No. 40 on postcard, p. 237.

Turn Page

USER SAYS TAP LIFE UP 43% ON THIS THIN-WALLED CASTING

...thanks to

FERROCARBO®

Users everywhere report similar experiences. In fact, on 67 machining tests in 11 large machine shops, castings of gray iron treated with FERROCARBO averaged *89.5%* greater machinability per tool than untreated castings. These premium castings are finer-grained, denser, stronger, yet they COST YOU NO MORE...because your foundryman, using FERROCARBO, makes worthwhile savings in raw material costs.

FOR FREE BOOKLET on FERROCARBO, citing actual case histories of faster machining, with longer tool life, write The Carborundum Company, Dept. 46, Niagara Falls, N.Y. 64-58

CARBORUNDUM®

HAVE YOU TRIED

THE

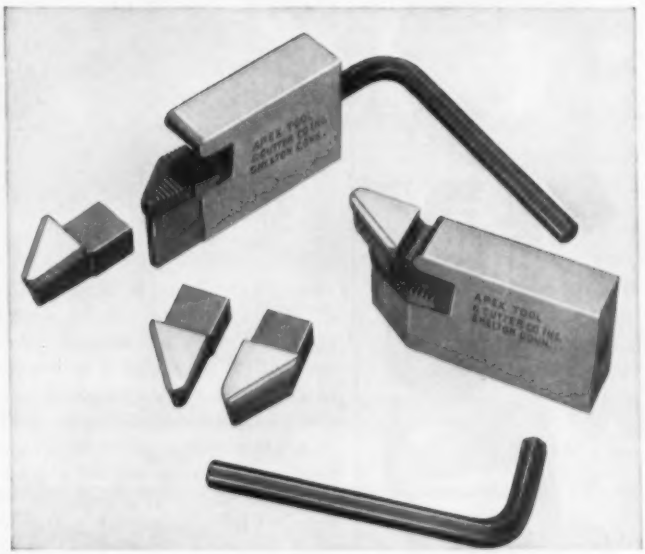
CLEARING HOUSE?

That "hard-to-find" machine for which you have been searching may be listed in this very issue. Look thru the Clearing House now!

For bargains in good used equipment, consult the Clearing House Section each week in the

IRON AGE

SPECIAL *APEX* HOLDERS AND TOOL BITS FOR ONLY "SELLERS" AXLE-FINISHING LATHES



For Economy, Increased Production, and Accurate Regrinding of Angles with Fixtures

Standard holders with inserted carbide-tipped tool bits reduce your costs and give improved working conditions. All tool bits are furnished finished ground with chip breakers and are ready for immediate use. Tool bits are adjustable in two directions to compensate for wear.

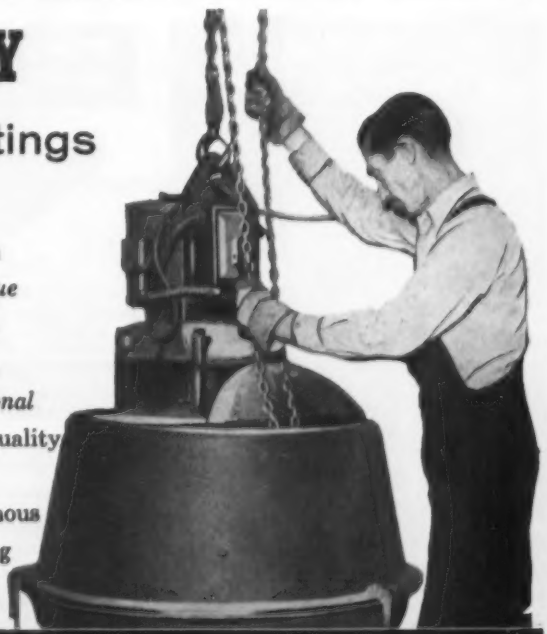
Full details mailed upon request.

The Apex Tool & Cutter Co., Inc.
Shelton 12, Conn.

SERVICE FOUNDRY

for the best in Steel Castings

Clean, sound, pattern-true steel castings afford: *Efficient Metal Distribution* for better weight-strength ratio—*Uniform Structure* for greater strength—*Fatigue Resistance* for longer life—*Wide Range of Mechanical Properties* for your specific requirements—*Minimum Machining* for lower production costs—and *Dimensional Stability* for better fit and better performance. Top quality *iron, steel and non-ferrous castings, gear cutting and machine work* have made the name "SERVICE" famous throughout many industries—their expert engineering consultation service has added to this fame.



SERVICE FOUNDRY a division of **AVONDALE MARINE WAYS, Inc.**

416 Erato Street, New Orleans, U. S. A. P. O. Box 1030, New Orleans, U. S. A.

Cable Address: "Serfdry"

ARMSTRONG *Drop Forged* LATHE DOGS

ARMSTRONG Lathe Dogs give extra service because they are drop forged from selected open hearth steel, and are heat treated to extreme toughness and stiffness. Hubs are made large enough to permit re-tapping, screws are also of special analysis steel and are hardened at the point to prevent upsetting. ARMSTRONG Dogs come in 10 types with square head or safety headless screws, with straight or bent tails. They are carried in stock by your local ARMSTRONG Distributor.

Write for Catalog

ARMSTRONG BROS. TOOL CO.
5209 West Armstrong Ave., Chicago 30, Ill.
New York and San Francisco

33% DECREASE IN DIE WEAR ON THIS GRAY IRON FITTING

...thanks to

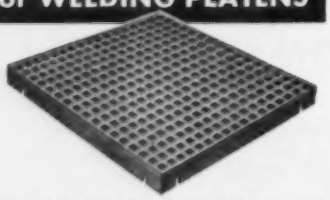
FERROCARBO®

Users everywhere report similar experiences. In fact, on 67 machining tests in 11 large machine shops, castings of gray iron treated with FERROCARBO averaged 89.5% greater machinability per tool than untreated castings. These premium castings are finer-grained, denser, stronger, yet they COST YOU NO MORE... because your foundryman, using FERROCARBO, makes worthwhile savings in raw material costs.

FOR FREE BOOKLET on FERROCARBO, citing actual case histories of faster machining, with longer tool life, write The Carborundum Company, Dept. 45, Niagara Falls, N.Y. 64-90

CARBORUNDUM®

BENDING BLOCKS or WELDING PLATENS



5 ft. by 5 ft. by 5½ in. cast steel blocks for layout, welding and assembly. Write today for information. Other sizes. Tools, stands & accessories.

ACORN IRON & SUPPLY CO.
Delaware Ave. & Poplar St. Philadelphia 23, Pa.

Like to speed up your reading?

Turn to pages 2 and 3 of The Iron Age every week and let the

Digest of the Week in Metalworking

help you find your favorite features.

IT PAYS TO READ IRON AGE ADS TOO!

Brake motor

Built to the rerated NEMA specifications, a more compact brake motor features the advantages of quick stops and positive holding action, as well as a through-shaft extension for hand cranks, tachometers, or other accessories. A direct-acting magnetic disc brake is used which can be connected either directly to motor terminals or to a separate power supply. As a safety measure the brake will set and hold, in event of power failure or low voltage, by mechanical spring action. Ratings from 1 to 30 hp. *U. S. Electrical Motors, Inc.*

For more data circle No. 41 on postcard, p. 237.

Teflon-cased capacitors

New teflon-cased capacitors are especially designed for sustained high temperature operation in aircraft, airborne computers and other applications in high ambient temperatures where high insulation resistance must be maintained.

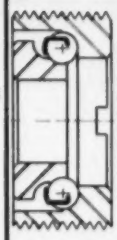
The new capacitors are mounted in teflon tubes with axial pigtail leads through teflon buttons that seal the case ends. Typical capacitors in this group are rated at 450 working volts, d-c, for continuous operation at 125°C. Under these conditions, unusually high insulation resistance, on the order of 10^7 meghohms, is maintained. *Film Capacitors, Inc.*

For more data circle No. 42 on postcard, p. 237.

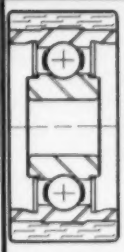
Have you investigated the design and cost saving opportunities offered by

NICE...

No. 7029 PULLEY FOR X-RAY MACHINE



No. 6959 THREADED O. D. CADMIUM PLATED BEARING FOR RADIO TUNING DEVICE



No. 7028 NEOPRENE TIRED ROLLER FOR DICTATING MACHINE

Standard and Special Ball Bearings Since 1902

Write for Cat. No. 150

NICE

NICE BALL BEARING CO.

NICETOWN • PHILADELPHIA • PENNSYLVANIA

Our Business is

MAKING HOLES!

Round holes, slots, square holes, ornamental holes. Need special perforating? Want precision—low cost? Accurate provides the greatest selection of perforations at a saving in time . . . material . . . money. Perforate up to ½" plate. Our engineers are prepared to help with run-of-the-mill demands—or toughest problem jobs. Write for FREE catalog!

SERVING THESE INDUSTRIES:

AIRCRAFT • AUTOMOTIVE • COMMUNICATIONS • ELECTRICAL EQUIPMENT • FARM MACHINERY • HEATING • RADIO AND RADAR • RAILROADS • SHIP BUILDING • WASHING MACHINES

IN THESE MATERIALS:

ALUMINUM • BRASS • BRONZE • COPPER • LEAD • MONEL METAL • STEEL • MASONITE • STAINLESS STEEL • PLYWOOD • PAPER • CLOTH

ACCURATE

perforating company

3636 S. KEDZIE AVENUE • CHICAGO 32, ILLINOIS

HERE'S THE STRONGEST BRONZE

HY-TEN-SL

A Bronze as Strong as Nickel Steel

Grade of HY-TEN-SL	1AA	1A	1	2	3	4
		TYPICAL VALUES (Minimums)				
TENSION						
Ultimate tensile strength lbs. per sq. in.						
Sand Cast	125,000	115,000	105,000	100,000	90,000	85,000
Rolled 1" and under	.....	120,000	110,000	105,000	95,000	85,000
Rolled or Forged, over 1"	.....	115,000	105,000	100,000	90,000	85,000
Yield Point (divider method)						
Sand Cast	95,000	75,000	60,000	55,000	45,000	40,000
Rolled 1" and under	.....	75,000	65,000	60,000	50,000	45,000
Rolled or Forged, over 1"	.....	75,000	65,000	60,000	50,000	45,000
Elongation in 2"—%						
Sand Cast	10	12	14	15	20	25
Forged or Rolled	.....	12	13		15	20
Reduction in area—%						
Sand Cast	.....	12	14	15	20	25
Forged or Rolled	.....	12	13		15	20
COMPRESSION						
Yield Point—lbs. per sq. in.	70,000	65,000	58,000	50,000	40,000	35,000
Permanent Set at 100,000 lbs. per sq. in. (max.)	.015	.020	.030	.050	.080	.125
Brinell hardness, No.	250	240	220	200	175	150

List of U. S. Government Specifications Covering HY-TEN-SL Bronze

ARMY
Forgings, Rolled Rod QQ-B-721 Class B
Castings...QQ-B-726 Class B and C

NAVY
Forgings and Rolled Rod 46B15d Class B
Castings, Aluminum-manganese Bronze 46B2

WATERTOWN and OTHER ARMY ARSENALS
Castings WXS-5
Forgings and Rolled Rod.....WXS-2

NAVAL GUN FACTORY
Washington Navy Yard
Castings—Trunnion Metal.....O.S.550

AIRCRAFT
See Navy and Army (above).

Send for 46 Page "Text Book"

AMERICAN MANGANESE BRONZE COMPANY

4701 RHAWN ST., PHILADELPHIA 34, PA.

Established 1909

more and more manufacturers are saying-

"Let's use

GRIFFIN®

COLD ROLLED STRIP STEEL"

Made to your specifications in all thicknesses from .002 to .375 inches and widths from ½" to 19" depending upon gauge.

Heavier gauges to special order.

NARROW ROLLED ROUND EDGE STRIP STEEL

In stock at

CENTRAL STEEL & WIRE CO.
Detroit, Chicago, Cincinnati

Wm. H. LEONORI & CO., Inc.
New York City

Call or Write

GRIFFIN

"since 1899"

MANUFACTURING CO. ERIE, PA.

SUPERIOR TUBING acts as a temperature and mechanical handling shield for delicate sub-surface, radioactive logging instruments.

SMOOTH SURFACES, CLOSE TOLERANCES, LIGHT WEIGHT: REASONS WHY SUPERIOR TUBING IS USED TO HOUSE THESE DELICATE WELL SURVEYING INSTRUMENTS

Well Surveys of Tulsa, Okla., purchases Superior Seamless Type 304 Stainless Tubing in large OD, light wall sizes and in 63 in. lengths. Into these tubes, which in the finished state vary from 28 to 31 in., radioactive well-logging instruments are inserted—instruments so delicate that stray electrical waves or gases leaking into the casing may throw them off.

For that reason, the tubing is supplied in the "as drawn" condition, with a smooth surface that has a high radiation factor. Stainless is specified because plated material used in the past flaked off and short-circuited the instruments. The thin wall size (2.098" x .018" wall) is important; first, because of weight and, second, because of the close fit demanded. After the instruments are inserted, the tubing—closed by spinning—goes into an outer housing which must withstand pressures of 20,000 psi.

Whatever you want tubing for—an instrument housing, hypodermic needle, radio antenna, or heat exchanger—you'll find that the high quality of Superior tubing saves you time, money and production headaches. Send for your free copy of Bulletin 40—*A Guide to the Selection and Application of Superior Tubing*. SUPERIOR TUBE COMPANY, 2004 Germantown Ave., Norristown, Pa. *On the West Coast:* Pacific Tube Co., 5710 Smithway St., Los Angeles 22, Calif.

PRE-TESTING an assembly before it is inserted into the Superior tube.

Superior Tube

The big name in small tubing

All analyses .010" to ⅝" OD
Certain analyses in light walls up to 2¼" OD

The Iron Age SUMMARY . . .

Lack of ingot capacity plaguing producers and consumers . . . Railroad freight car program grows . . . Consumer inventories precarious.

Capacity Problem . . . Surging steel demand has reached the point where producers can do little except improvise and hope for the best. Their big problem: lack of ingot capacity.

Producers are allocating raw steel to rolling mills on the basis of product demand. But there isn't enough to go around. Consumers are under allocation, too. Nevertheless, backlogs are building up and deliveries continue to lag.

Emergency shipments have become an everyday occurrence. Desperate consumers are buying more from warehouses—when they can get it. But too many emergencies are penalizing the forward-looking consumer who stocked up last year when he had the chance. If this keeps up, everybody will be in the same boat.

Strain On Plates . . . The railroads' freight car program is shaping up as one of the biggest of the post-war period. What looked like a 50,000-car program last June probably will wind up closer to 100,000 cars before the year is out. The reason: orders must be placed by the end of 1955 to qualify for fast tax writeoffs.

This will mean continued heavy pressure on plates and structurals, two products that were tight even before the freight car program got underway. Although the railroads were late coming into the market, the mills are leaning over backwards to take care of them because of their importance to defense.

Other important plate users—the farm implement makers, tank fabricators, linepipe producers, and building contractors—will have tough going over the next several months. Carryovers into 1956 will be substantial and delivery promises will fall farther behind.

Major Products Tight . . . But the situation in plates, bad as it is, is not too much worse than that of other major products. Sheets, strip, stainless, oil country goods, galvanized sheets, and bars also are in tight supply.

Consumer inventories are in bad shape. And so long as overall demand continues at its present fast pace there will be little or no opportunity to rebuild stocks to a safe working level. This situation will continue well into the new year.

Meanwhile, the mills are straining to get the last possible pound from melting furnaces. This is evident in the gradual improvement in ingot production during the last month. But the wear and tear on equipment may cause trouble later in the year.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week 2,316	Last Week 2,341	Month Ago 2,243	Year Ago 1,713
Ingot Index (1947—1949=100)	144.0	145.7	139.5	106.5
Operating Rates				
Chicago	96.5	97.0*	97.0	73.5
Pittsburgh	99.0	99.0	94.0	69.0
Philadelphia	99.0	98.0*	96.0	62.0
Valley	97.0	99.0	96.0	62.0
West	73.5	94.0	92.7	85.5
Detroit	97.0	94.0*	86.0	93.0
Buffalo	105.0	105.0*	100.0	68.5
Cleveland	102.0	102.0	95.7	72.5
Birmingham	97.5	96.0	92.0	74.0
S. Ohio River	90.0	85.0	86.5	83.0
Wheeling	98.0	100.0	97.0	93.0
St. Louis	99.0	88.0	102.0	75.5
Northeast	89.0	97.0	95.0	47.0
Aggregate	96.0	97.0	93.0	71.0

*Revised

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.174	5.174	5.174	4.801
Pig Iron (Gross ton)	$59.05	$59.09	$59.09	$56.59
Scrap, No. 1 hvy (gross ton)	$44.83	$44.83	$43.83	$32.00
Nonferrous				
Aluminum ingot	24.40	24.40	24.40	22.20
Copper, electrolytic	43.00	43.00	43.00	30.00
Lead, St. Louis	15.30	15.30	14.80	14.80
Magnesium, ingot	33.25	33.25	33.25	27.75
Nickel, electrolytic	64.50	64.50	64.50	63.08
Tin, Straits, N. Y.	96.25	96.75	95.375	94.625
Zinc, E. St. Louis	13.00	13.00	12.50	11.50

Mills Boost Tinplate Prices

New prices effective Oct. 1 for semi-annual contracts . . . Market continues tight on all fronts with plates in strongest demand . . . Inventories low.

◆ TINPLATE PRICES have been increased for the marketing period of Oct. 1, 1955, through March 31, 1956, first change since Oct. 1, 1954.

Mill price bases for electrolytic and hot-dipped tinplate, black plate, and terne plate are affected by the boost. The new price bases represent an increase of 40¢ per base box except for special coated manufacturing terne plate which is increased 85¢ per base box. Overall effect is an average increase for tin mill products of approximately 5.5 pct.

Price rise is belated since the across-the-board steel price increases following the steel strike because tinplate is sold on semi-annual contract. Tinplate is sold out and orders are now being taken for next year.

Export prices of tinplate follow the same pattern, with increases concurrent with changes in domestic prices. For new mill prices, see THE IRON AGE Steel Prices, p. 299.

Meanwhile, the basic steel market remains unchanged on all fronts, with most products in varying degrees of tight supply. Some improvements in the inventory situation are noted, but these are among a few large consumers and constitute the minority. At the same time, some large appliance makers are in such a tight situation that production schedules are in danger.

With books beginning to open up for the first quarter, mills are making every effort to schedule most carefully, to avoid adding to the delivery delays which have put customer relations at a low point.

There is definite assurance that customers will get what tonnage they can put on the books.

SHEETS AND STRIP . . . Only scant hope exists for sheet and strip consumers for any easing in supply. But there are some signs that a few major users are seeing daylight between inventory and production requirements. One of **Chicago's** biggest auto plants has a comfortable inventory and is staying ahead of consumption. This may indicate some easing along the line, although an appliance maker in the same market is threatened with production slowdowns because of added delivery delays. No real easing is expected for months, however, and where fourth quarter books are opened, it is on strict allocation.

BARS . . . Fresh demand from automotive and farm implement makers for hot-rolled bars is tightening this market another notch. Cold-finished bars are easier, but only to a degree. Carryovers on bars are expected to be somewhat less than on a few other products. Bar inventories in warehouses appear to be in better shape and few users will have production trouble from this quarter. First indications from **Detroit** indicate that carryovers will not be as serious as for other products. Demand for both hot- and cold-finished will be strong well into 1956, although the supply situation is less critical than a few weeks ago.

Purchasing Agent's Checklist:

MATERIALS: How automakers solve shortages? . . . . . p. 154

STEEL: Ingot shortage keeps market tight . . . . . p. 287

COPPER: No relief from stockpile in sight . . . . . p. 294

PLATES . . . Railroads, farm equipment makers and storage tank makers combine to make the market tight everywhere. In **Chicago** no light plate consumer is able to get what he needs, or at least would like. **Detroit** reports the same critical situation for light gages, although plate is not easy in any size or specification. Deliveries are running from six to eight weeks late in **Pittsburgh**, the same as in most markets.

STRUCTURALS . . . Structural situation closely resembles the plate market and is only slightly less tight. Even in **Chicago**, with new structural capacity, no easing is apparent. Light structurals continue to be extremely tight, refusing to ease in line with the conventional seasonal pattern. In **Detroit** wide flange beams are tightest.

TUBULAR PRODUCTS . . . Seamless tubing continues to be in solid demand and is averaging around two weeks' delay in delivery time. Warehouse stocks of seamless in **Chicago**, however, are called good and no inventory problem exists there. Buttweld pipe is currently running in an easier delivery and availability pattern in **Chicago** and isn't through fourth quarter books as yet. Electric-weld is tighter than buttweld and is booked into late December. **Pittsburgh** reports that oil country consumers are now much more cooperative in informing producers of requirements for next year.

WIRE PRODUCTS . . . Tail end of harvesting season is in sight and stronger demand for merchant wire products is appearing. There is some space on the books in the fourth quarter although demand is relatively strong. Manufacturers' wire, particularly spring wire, is bouncing back on the heels of automotive demand resulting from new model production. Fourth quarter is sold out in **Detroit**.

WAREHOUSES . . . Pressure on warehouses varies, but warehousemen generally will take all they can get. Inventories everywhere are out of balance. Demand on warehouses is stronger in the **Midwest**, where many large consumers are forced into the picture to meet day-to-day production demands. In the **East**, flood repair has contributed to the run. Structurals and plates are tightest at the warehouse level as they are at the mill.

Comparison of Prices

(Effective Oct. 4, 1955)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Oct. 5 1955	Sept. 27 1955	Sept. 6 1955	Oct. 5 1954
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.325¢	4.325¢	4.325¢	4.05¢
Cold-rolled sheets	5.325	5.325	5.325	4.95
Galvanized sheets (10 ga.)	5.85	5.85	5.85	5.45
Hot-rolled strip	4.325	4.325	4.325	4.05
Cold-rolled strip	6.29	6.29	6.29	5.82
Plate	4.52	4.52	4.52	4.237
Plates wrought iron	9.30	9.30	9.30	9.30
Stainl's C-R strip (No. 302)	44.50	44.50	44.50	41.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$9.05	$9.05	$9.05	$8.95
Tinplate, electro (0.50 lb.)	7.75	7.75	7.75	7.65
Special coated mfg. ternes	7.85	7.85	7.85	7.75
Bars and Shapes: (per pound)				
Merchant bars	4.65¢	4.65¢	4.65¢	4.312¢
Cold finished bars	5.90	5.90	5.90	5.40
Alloy bars	5.65	5.65	5.65	5.075
Structural shapes	4.60	4.60	4.60	4.25
Stainless bars (No. 302)	38.25	38.25	38.25	35.50
Wrought iron bars	10.40	10.40	10.40	10.40
Wire: (per pound)				
Bright wire	6.25¢	6.25¢	6.25¢	5.75¢
Rails: (per 100 lb.)				
Heavy rails	$4.725	$4.725	$4.725	$4.45
Light rails	5.65	5.65	5.65	5.35
Semifinish Steel: (per net ton)				
Rerolling billets	$68.50	$68.50	$68.50	$64.00
Slabs, rerolling	68.50	68.50	68.50	64.00
Forging billets	84.50	84.50	84.50	78.00
Alloy blooms, billets, slabs	96.00	96.00	96.00	86.00
Wire Rod and Skelp: (per pound)				
Wire rods	5.025¢	5.025¢	5.025¢	4.675¢
Skelp	4.225	4.225	4.225	3.90
Finished Steel Composite: (per pound)				
Base price	5.174¢	5.174¢	5.174¢	4.801¢

	Oct. 5 1955	Sept. 27 1955	Sept. 6 1955	Oct. 5 1954
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$63.69	$63.69	$63.69	$61.19
Foundry, Valley	59.00	59.00	59.00	56.50
Foundry, Southern, Cin'ti	62.93	62.93	62.93	60.43
Foundry, Birmingham	55.00	55.00	55.00	52.88
Foundry, Chicago	59.00	59.00	59.00	56.50
Basic, del'd Philadelphia	62.77	62.77	62.77	60.27
Basic, Valley furnace	58.50	58.50	58.50	56.00
Malleable, Chicago	59.00	59.00	59.00	56.50
Malleable, Valley	59.00	59.00	59.00	56.50
Ferromanganese‡, cents per lb.	9.50¢	9.50¢	9.50¢	9.50¢
‡ 74-76 pct Mn base.				
Pig Iron Composite: (per gross ton)				
Pig iron	$59.00	$59.00	$59.00	$56.50
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$44.50	$44.50	$44.50	$32.50
No. 1 steel, Phila. area	46.50	46.50	46.50	30.00
No. 1 steel, Chicago	43.50	43.50	40.50	33.50
No. 1 bundles, Detroit	39.00	39.00	38.50	27.50
Low phos., Youngstown	47.50	47.50	47.50	35.00
No. 1 mach'y cast, Pittsburgh	46.50	46.50	45.50	42.50
No. 1 mach'y cast, Philadel'a	47.50	47.50	46.50	41.00
No. 1 mach'y cast, Chicago	53.50	53.50	52.50	42.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	$44.83	$44.83	$43.83	$32.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$13.25	$13.25	$13.25	$14.25
Foundry coke, prompt	16.25	16.25	16.25	16.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	43.00	43.00	43.00	30.00
Copper, Lake, Conn.	43.00	43.00	43.00	30.00
Tin, Straits, New York	96.25	96.75*	95.375	94.625
Zinc, East St. Louis	13.00	13.00	12.50	11.50
Lead, St. Louis	15.30	15.30	14.80	14.80
Aluminum, virgin ingot	24.40	24.40	24.40	22.20
Nickel, electrolytic	64.50	64.50	64.50	63.08
Magnesium, ingot	33.25	33.25	33.25	27.75
Antimony, Laredo, Tex.	33.00	33.00	33.00	28.50

† Tentative. ‡ Average. * Revised.

Finished Steel Composite
Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite
Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite
Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

←To identify producers, see Key on P. 300.→

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem *B3*	60.50	61.00	61.50	62.00	.....
Birdsboro, Pa. *B6*	60.50	61.00	61.50	62.00	.....
Birmingham *R3*	54.50	55.00	.....	.....	.....
Birmingham *W9*	54.50	55.00	59.00	.....	.....
Birmingham *U4*	54.50	55.00	59.00	.....	.....
Buffalo *R3*	58.50	59.00	59.50	.....	.....
Buffalo *H1*	58.50	59.00	59.50	.....	.....
Buffalo *W6*	58.50	59.00	59.50	60.00	.....
Chester *C17*	54.50	55.00	55.50	.....	.....
Chicago *I4*	58.50	59.00	59.00	59.50	.....
Cleveland *A5*	58.50	59.00	59.00	59.50	63.50
Cleveland *R3*	58.50	59.00	59.00	.....	.....
Daingerfield *L3*	55.00	55.00	55.00	.....	.....
Duluth *I4*	58.50	59.00	59.00	59.50	.....
Erie *I4*	58.50	59.00	59.00	59.50	.....
Everett *M6*	.....	61.00	61.50	.....	.....
Fontana *K1*	64.50	65.00	.....	.....	.....
Geneva, Utah *C7*	58.50	59.00	.....	.....	.....
Granite City *G2*	60.40	60.90	61.40	.....	.....
Hubbard *Y1*	.....	.....	59.00	.....	.....
Lone Star *L3*	.....	55.00	.....	.....	.....
Minnequa *C6*	60.50	61.00	61.50	.....	.....
Monessen *P6*	58.50	.....	.....	.....	.....
Neville Is. *P4*	58.50	59.00	59.00	.....	.....
N. Tonawanda *T1*	.....	59.00	59.50	.....	.....
Pittsburgh *U1*	58.50	.....	.....	59.50	.....
Sharpsville *S1*	58.50	59.00	59.00	59.50	.....
So. Chicago *R3*	58.50	.....	59.00	.....	.....
Steelton *B3*	60.50	61.00	61.50	62.00	66.50
Swedeland *A2*	60.50	61.00	61.50	62.00	.....
Toledo *I4*	58.50	59.00	59.00	59.50	.....
Troy, N. Y. *R3*	60.50	61.00	61.50	62.00	66.50
Youngstown *Y1*	.....	.....	59.00	59.50	.....

DIFFERENTIALS: Add, 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional, 0.25 pct nickel.

Silvery Iron: Buffalo, *H1*, $68.75; Jackson, *J1*, *G1*, $67.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	17.75	19.00	—	20.25	31.50	25.00	33.75	15.00	—	15.25
Slabs, billets, rerolling	22.25	24.75	26.75	26.00	40.25	32.00	43.00	19.50	—	19.75
Forg. discs, die blocks, rings	—	—	—	—	—	—	—	—	—	—
Billets, forging	31.75	32.00	34.75	33.75	51.25	38.25	51.00	25.50	26.00	26.00
Bars, wires, structurals	38.00	38.25	41.00	40.25	60.75	45.25	60.00	30.50	31.00	31.00
Plates	40.00	40.25	42.75	43.00	64.00	49.25	64.75	31.75	33.00	32.25
Sheets	44.25	44.50	—	47.25	68.25	54.25	73.50	36.25	—	36.75
Strip, hot-rolled	32.00	34.50	—	37.25	58.25	44.25	58.75	—	—	—
Strip, cold-rolled	41.00	44.50	—	47.25	68.25	54.25	73.50	36.25	—	36.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; McKeesport, Pa., *U1*; Washington, Pa., *W2*, *J3*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U3*; New Castle, Ind., *I2*; Ft. Wayne, *J4*; Philadelphia, *D5*.

Strip: Midland, Pa., *C11*; Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Middletown, O., *A7*; Harrison, N. J., *D3*; Youngstown, *C5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (.25¢ per lb higher); *W1* (.25¢ per lb higher); New Bedford, Mass., *R6*.

Bar: Baltimore, *A7*; Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*; Ft. Wayne, *I4*; Philadelphia, *D3*; Detroit, *R5*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Philadelphia, *D5*.

Forged discs, die blocks, rings: Pittsburgh, *C11*; Syracuse, *C11*; Ferndale, Mich., *A3*; Washington, Pa., *J3*.

Forgings billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*.

Chicago Leads Firm Market

Railroad, blast furnace and cast grades advance again . . . East reports moderate activity, holding prices . . . No change in export rules . . . Composite holds.

◆ CHICAGO again showed the way this week. The area reported good activity and broad gains in blast furnace, railroad and foundry grades.

In the East, the only price change was in cupola cast, which moved up $2. However, the area showed a slight pickup in activity. For the second straight week, a leading area mill bought No. 1 heavy melting at the going price.

Elsewhere, selective gains were made. Railroad grades advanced $1 to $3 in Birmingham. Open-hearth and blast furnace scrap improved in Boston. Detroit saw a local mill buying No. 1 heavy melting at the going price. The prospect of heavier generation of automotive scrap in this area was seen loosening the market.

THE IRON AGE Composite for No. 1 heavy melting steel scrap remains unchanged at $44.83.

To no one's surprise, the Commerce Dept. has indicated that ferrous scrap export regulations will continue unchanged "until further notice." This probably means no further restrictions for at least the rest of the year.

Pittsburgh . . . A small purchase of secondary open hearth grades by an independent consumer was the only activity in a continuing dull market. The purchase involved No. 2 steel at $41 per ton and No. 2 bundles at $38. Meanwhile, consumers held off on purchase of the top grade. Inventories reportedly are adequate and incoming industrial scrap is tiding them over in their apparently successful efforts to hold the market within bounds. Consumers are making the best of blast furnace facilities to reduce the tonnage of scrap necessary to keep open-hearths running at top speed.

Chicago . . . The market continues strong and active with prices on last week's listings showing no signs of weakening. Some strength is reflected currently in blast furnace grades and the railroad specialties. The firm cast market which has also been noticeable for the past several weeks is holding strong with some price advances over earlier listings. All indications are the market will continue firm with perhaps some additional strength materializing a little later on. Some out-of-area purchases of heavy breakable cast at several dollars above current listings are reported.

Philadelphia . . . The market here continues strong and steady with cupola cast advancing $2 and other grades holding firm. Leading area mill came in again last week for No. 1 heavy melting at the going price. Other activity in the open hearth grades was limited to normal weekly buying by area mills. A nearby foundry bought cupola cast at a higher price and all the foundry grades remain very strong. Although a top price of $39 per ton is being paid for No. 2 bundles, some mills in the area were buying this grade for as low as $35 per ton. For this reason, THE IRON AGE price for No. 2 bundles is being quoted this week at $35 to $39 per ton.

New York . . . Both domestic and export demand for all grades continues strong. But prices are unchanged save for mixed yard cast which sold this week at $3 per ton higher, making the current price $37, top. Other cast grades were firm but unchanged.

Detroit . . . Resistance to high prices began to break this week when a local mill bought No. 1 heavy melting on a $39.50 FOB basis. Automotive lists which closed last week were neither up nor down more than 50¢. Indications are that the market will remain steady at least for another month because the increase in the amount of scrap generated will balance the increase in demand. Brokers believe this is the main reason for the mill buy this week.

Cleveland . . . Industrial No. 1 scrap sold for $48.50 in the Valley, up $1.50 per ton over previous levels. One major Valley producer and another on the fringe of the district made purchases. A small lot of special material went for $49. Cleveland dealer market remained quiet, but monthly automotive list went for $1 or more over dealer market.

Birmingham—The district's largest purchaser of openhearth scrap having bought sizable quantities early in September, is out of the market while these orders are being filled; but the second largest, at Atlanta, Ga., returned to the market offering an increase of $1 a ton for local scrap and a springboard of $5 a ton on scrap originating in areas where freight rates to Atlanta tops $4 a ton.

St. Louis . . . The steel operating rate jumped 10 points to 98.6 pct during the week. The supply of scrap iron is getting tight, making it more difficult to get sufficient tonnages to equal melt, since all markets are pulling to get 100 pct of requirements. Borings and turnings are higher on buying by outside interests.

Cincinnati . . . Fringe mill raised monthly buying price $2 to meet level of local mill, keeping prices unchanged on prime grades. One mill in area expected to buy in next week. Foundry and blast furnace market picking up markedly, especially on rails and some cast grades.

Buffalo . . . Prices are holding in a quiet Buffalo market. Brokers are looking for new business to turn up soon, but right now there is no new buying.

Boston . . . Prices of openhearth, electric furnace and blast furnace scrap advanced 50¢ to $1 as the scrap market here showed a slight increase in activity.

West Coast . . . Competition between mills and export buyers keeps the market strong. The mills are trying to hold the price line, but can't let export dominate market. No. 1 cupola cast advanced $2 in Los Angeles.

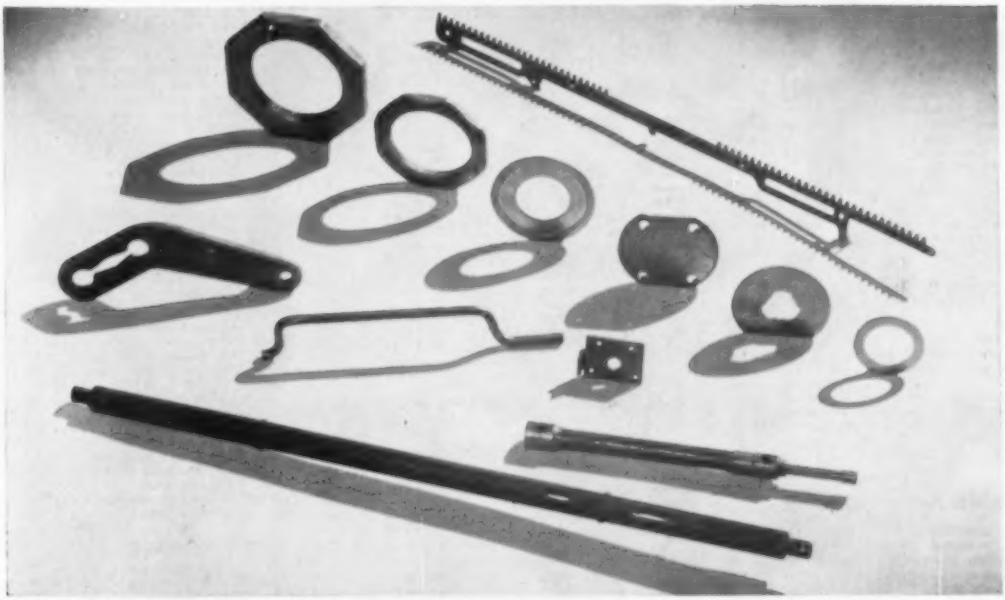
Announcing

ANOTHER **STANDARD** *EXCLUSIVE!*

STANDARD'S

DRY CYANIDING

PROCESS



Typical Automotive and Aircraft Parts Successfully "Dry Cyanided" by Standard Steel Treating Company

ADVANTAGES OF DRY CYANIDING:

1. **Distortion and size change held to a minimum.**
2. **Produces a hard surface, highly corrosion resistant.**
3. **Finished parts have greater wear resistance.**
4. **Finished parts are clean and bright, requiring no cleaning when plating is desired.**
5. **It is an *ECONOMICAL* case hardening process.**

★ YOUR SAMPLES PROCESSED WITHOUT OBLIGATION ★

We Maintain a Complete Metallurgical Department As a Service and Courtesy for Our Customers

"THE STANDARD OF THE HEAT TREATING INDUSTRY"

STANDARD STEEL TREATING CO.

3467 Lovett Avenue • Detroit 10, Michigan • Phone TAshmoo 5-0600

Scrap Prices *(Effective Oct. 4, 1955)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$44.00 to $45.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	44.00 to 45.00
No. 2 bundles	37.00 to 38.00
Machine shop turn.	29.00 to 30.00
Mixed bor. and ma. turns.	29.00 to 30.00
Shoveling turnings	33.00 to 33.00
Cast iron borings	33.00 to 33.00
Low phos. punch'gs, plate	48.00 to 49.00
Heavy turnings	43.00 to 43.00
No. 1 RR. hvy. melting	47.00 to 48.00
Scrap rails, random lgth.	50.50 to 51.50
Rails 2 ft and under	54.00 to 55.00
RR. steel wheels	53.50 to 53.50
RR. spring steel	53.50 to 53.50
RR. couplers and knuckles	53.50 to 53.50
No. 1 machinery cast.	46.00 to 47.00
Cupola cast.	41.00 to 42.00
Heavy breakable cast.	38.00 to 39.00

Chicago

No. 1 hvy. melting	$43.00 to $44.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 factory bundles	46.00 to 47.00
No. 1 dealers' bundles	43.00 to 44.00
No. 2 dealers' bundles	33.00 to 34.00
Machine shop turn.	29.00 to 30.00
Mixed bor. and turn.	31.00 to 32.00
Shoveling turnings	31.00 to 32.00
Cast iron borings	31.00 to 32.00
Low phos. forge crops	52.00 to 53.00
Low phos. punch'gs, plate	50.00 to 51.00
Low phos. 3 ft and under	49.00 to 50.00
No. 1 RR. hvy. melting	49.00 to 50.00
Scrap rails, random lgth.	56.00 to 57.00
Rerolling rails	66.00 to 67.00
Rails 2 ft and under	62.00 to 63.00
Locomotive tires, cut	52.00 to 53.00
Cut boilers & side frames	54.00 to 55.00
Angles and splice bars	58.00 to 59.00
RR. steel car axles	56.00 to 57.00
RR. couplers and knuckles	52.00 to 53.00
No. 1 machinery cast.	53.00 to 54.00
Cupola cast.	48.00 to 50.00
Heavy breakable cast.	41.00 to 42.00
Cast iron brake shoes	39.00 to 40.00
Cast iron car wheels	48.00 to 49.00
Malleable	58.00 to 59.00
Stove plate	40.00 to 41.00

Philadelphia Area

No. 1 hvy. melting	$46.00 to $47.00
No. 2 hvy. melting	39.00 to 41.00
No. 1 bundles	46.00 to 47.00
No. 2 bundles	35.00 to 39.00
Machine shop turn.	27.50 to 28.50
Mixed bor. short turn.	27.50 to 28.50
Cast iron borings	27.50 to 28.50
Shoveling turnings	30.00 to 31.00
Clean cast chem. borings	27.00 to 28.00
Low phos. 5 ft and under	48.00 to 49.00
Low phos. 3 ft and under	49.00 to 50.00
Low phos. punch'gs	49.00 to 50.00
Elec. furnace bundles	47.00 to 48.00
Heavy turnings	42.00 to 43.00
RR. steel wheels	50.00 to 51.00
RR. spring steel	50.00 to 51.00
Rails 18 in. and under	57.00 to 58.00
Cupola cast	41.00 to 42.00
Heavy breakable cast.	45.00 to 46.00
Cast iron car wheels	51.00 to 52.00
Malleable	57.00 to 58.00
Unstripped motor blocks	29.00 to 31.00
No. 1 machinery cast.	47.00 to 48.00

Cleveland

No. 1 hvy. melting	$43.50 to $44.50
No. 2 hvy. melting	38.00 to 39.00
No. 1 bundles	43.50 to 44.50
No. 2 bundles	36.00 to 36.00
No. 1 busheling	43.50 to 44.50
Machine shop turn.	24.50 to 25.50
Mixed bor. and turn.	28.50 to 29.50
Shoveling turnings	28.50 to 29.50
Cast iron borings	28.50 to 29.50
Cut struct'r'l & plates, 2 ft & under	43.00 to 43.00
Drop forge flashings	43.00 to 44.00
Low phos. punch'gs, plate	44.00 to 45.00
Foundry steel, 2 ft & under	47.00 to 48.00
No. 1 RR. heavy melting	47.00 to 48.00
Rails 3 ft and under	57.00 to 58.00
Rails 18 in. and under	58.00 to 59.00
Railroad grate bars	37.00 to 38.00
Steel axle turnings	30.00 to 31.00
Railroad cast.	49.00 to 50.00
No. 1 machinery cast.	49.00 to 50.00
Stove plate	45.00 to 46.00
Malleable	51.00 to 52.00

Youngstown

No. 1 hvy. melting	$46.00 to $47.00
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles	46.00 to 47.00
No. 2 bundles	39.00 to 40.00
Machine shop turn.	24.00 to 25.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. plate	47.00 to 48.00

Buffalo

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 busheling	39.00 to 40.00
No. 1 bundles	39.00 to 40.00
No. 2 bundles	32.00 to 33.00
Machine shop turn.	27.00 to 28.00
Mixed bor. and turn.	28.00 to 29.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. plate	45.00 to 46.00
Scrap rails, random lgth.	47.00 to 48.00
Rails 2 ft and under	52.00 to 53.00
RR. steel wheels	48.00 to 49.00
RR. spring steel	48.00 to 49.00
RR. couplers and knuckles	48.00 to 49.00
No. 1 machinery cast.	43.00 to 44.00
No. 1 cupola cast.	40.00 to 41.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$38.50 to $39.50
No. 2 hvy. melting	31.00 to 32.00
No. 1 bundles, openhearth	38.50 to 39.50
No. 2 bundles	27.00 to 28.00
New busheling	38.50 to 39.50
Drop forge flashings	38.00 to 39.00
Machine shop turn.	21.00 to 22.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	24.00 to 25.00
Low phos. punch'gs, plate	38.50 to 39.50
No. 1 cupola cast.	40.00 to 41.00
Heavy breakable cast.	34.00 to 35.00
Stove plate	35.00 to 36.00
Automotive cast.	43.00 to 44.00

St. Louis

No. 1 hvy. melting	$36.50 to $37.50
No. 2 hvy. melting	34.00 to 35.00
No. 1 bundles	39.00 to 40.00
No. 2 bundles	29.50 to 30.50
Machine shop turn.	27.00 to 28.00
Cast iron borings	28.00 to 29.00
Shoveling turnings	28.00 to 29.00
No. 1 RR. hvy. melting	46.00 to 47.00
Rails, random lengths	52.00 to 53.00
Rails, 18 in. and under	59.00 to 60.00
Locomotive tires uncut	59.00 to 60.00
Angles and splice bars	50.00 to 51.00
Std. steel car axles	49.00 to 50.00
RR. specialties	50.00 to 51.00
Cupola cast.	46.00 to 47.00
Heavy breakable cast.	35.00 to 36.00
Cast iron brake shoes	37.00 to 38.00
Stove plate	38.00 to 39.00
Cast iron car wheels	47.00 to 48.00
Malleable	48.00 to 49.00
Unstripped motor blocks	38.50 to 39.50

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$35.50 to $36.50
No. 2 hvy. melting	29.00 to 30.00
No. 1 bundles	35.50 to 36.50
No. 2 bundles	26.00 to 27.00
No. 1 busheling	35.50 to 36.50
Elec. furnace, 3 ft & under	37.50 to 38.50
Machine shop turn.	18.00 to 19.00
Mixed bor. and short turn.	20.50 to 21.50
Shoveling turnings	23.00 to 24.00
Clean cast chem. borings	18.00 to 19.00
No. 1 machinery cast.	31.00 to 32.00
Mixed cupola cast.	29.00 to 30.00
Heavy breakable cast.	31.00 to 32.00
Stove plate	28.00 to 29.00
Unstripped motor blocks	17.00 to 18.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$40.50 to $41.50
No. 2 hvy. melting	35.00 to 36.00
No. 2 bundles	32.00 to 33.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	22.00 to 23.00
Clean cast chem. borings	24.00 to 25.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	36.00 to 37.00
Charging box cast.	37.00 to 38.00
Heavy breakable cast.	37.00 to 38.00
Unstripped motor blocks	24.00 to 25.00

Birmingham

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 bundles	36.00 to 37.00
No. 2 bundles	28.00 to 29.00
No. 1 busheling	36.00 to 37.00
Machine shop turn.	25.00 to 26.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	17.00 to 18.00
Electric furnace bundles	38.00 to 39.00
Bar crops and plate	43.00 to 44.00
Structural and plate, 2 ft	42.00 to 43.00
No. 1 RR. hvy. melting	42.00 to 43.00
Scrap rails, random lgth.	51.00 to 52.00
Rails, 18 in. and under	57.00 to 58.00
Angles & splice bars	50.00 to 51.00
Rerolling rails	56.00 to 57.00
No. 1 cupola cast.	47.50 to 48.50
Stove plate	44.50 to 45.50
Charging box cast.	28.00 to 29.00
Cast iron car wheels	38.00 to 39.00
Unstripped motor blocks	36.00 to 37.00
Mashed tin cans	15.00 to 16.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$40.50 to $41.50
No. 2 hvy. melting	34.00 to 35.00
No. 1 bundles	40.50 to 41.50
No. 2 bundles	32.00 to 33.00
Machine shop turn.	27.00 to 28.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	31.00 to 32.00
Cast iron borings	24.00 to 25.00
Low phos., 18 in. & under	48.00 to 49.00
Rails, random lengths	51.00 to 52.00
Rails, 18 in. and under	57.00 to 58.00
No. 1 cupola cast.	44.00 to 45.00
Hvy. breakable cast.	40.00 to 41.00
Drop broken cast.	49.00 to 50.00

San Francisco

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	32.00
No. 1 bundles	34.00
No. 2 bundles	29.00
No. 3 bundles	25.00
Machine shop turn.	12.00
Cast iron borings	11.00
No. 1 RR. hvy. melting	34.00
No. 1 cupola cast.	42.00

Los Angeles

No. 1 hvy. melting	$33.00
No. 2 hvy. melting	31.00
No. 1 bundles	33.00
No. 2 bundles	28.00
No. 3 bundles	24.00
Machine shop turn.	12.00
Shoveling turnings	16.00
Cast iron borings	12.00
Elec. furn. 1 ft and under	33.00
No. 1 RR. hvy. melting	33.00
No. 1 cupola cast.	44.00

Seattle

No. 1 hvy. melting	$35.50
No. 2 hvy. melting	31.50
No. 2 bundles	25.50
No. 3 bundles	21.50
No. 1 cupola cast.	35.00
Mixed yard cast.	35.00

Hamilton, Ont.

No. 1 hvy. melting	$38.50
No. 2 hvy. melting	35.50
No. 1 bundles	38.50
No. 2 bundles	32.50
Mixed steel scrap	32.50
Bushelings	33.50
Bush., new fact. prep'd	36.50
Bush., new fact. unprep'd	32.50
Machine shop turn.	16.00
Short steel turn.	25.50
Mixed bor. and turn.	$16.00 to 17.00
Rails, rerolling	47.50
Cast scrap	42.00 to 45.00

A
SYMBOL
OF
LEADERSHIP
IN
IRON & STEEL
SCRAP
SINCE
1889

Luria Brothers and Company, Inc.

MAIN OFFICE
LINCOLN-LIBERTY BLDG.
Philadelphia 7, Penna.

PLANTS
LEBANON, PENNA. DETROIT (ECORSE), MICHIGAN
READING, PENNA. PITTSBURGH, PENNA.
MODENA, PENNA.
ERIE, PENNA.

OFFICES

BIRMINGHAM, ALA.	DETROIT, MICHIGAN	PITTSBURGH, PENNA.
BOSTON, MASS.	HOUSTON, TEXAS	PUEBLO, COLORADO
BUFFALO, N. Y.	LEBANON, PENNA.	READING, PENNA.
CHICAGO, ILLINOIS	LOS ANGELES, CAL.	ST. LOUIS, MO.
CLEVELAND, OHIO	NEW YORK, N. Y.	SAN FRANCISCO, CAL.
	SEATTLE, WASH.	

EXPORTS - IMPORTS — LIVINGSTON & SOUTHARD, INC., 99 Park Avenue, New York, N. Y. *Cable Address:* FORENTRACO

ODM Speaks on Non-Ferrous

Flemming rejects request for release of copper from national stockpile . . . Tells aluminum producers to stand by . . . Diverts nickel to industry.

◆ OFFICE of Defense Mobilization Chief Dr. Arthur S. Flemming had quite an active week making vital pronouncements affecting the copper, aluminum, and nickel fields.

Initially, Dr. Flemming made public his reply to Herbert Barchoff, president of the Copper and Brass Warehouse Assn., concerning his request that the Government release copper from the national stockpile to ease the current shortage.

Answer is No

The answer is a simple no—one which Mr. Barchoff might have expected since according to Dr. Flemming such a move would be illegal. The stockpile legislation specifically states that materials within it can't be released unless the President decides it is desirable for national defense. This pretty well squashes any possible relief from this quarter, especially considering the President's health.

Of course, the ODM agreed to continue its policy of diverting shipments earmarked for the stockpile to industry. Mr. Barchoff obviously doesn't think that this will be enough. He most certainly knew the legal implications and therefore made his request hoping that possibly the copper could be released to defense contractors and thereby take some demand off the market.

If it can be assumed that the left hand knew what the right hand was doing Mr. Barchoff actually had his answer 24 hours earlier when the Business and Defense Services Administration declared that they expected copper supply and demand to be in "rough balance" in the last quarter of 1955. Conditions on which this depends, according to BDSA are (1) continued restriction on export, (2) continued deferment of copper from stockpile to industry and (3) unrestricted mine and smelter operation.

BDSA estimates demand at 451,000 tons and production of refined copper about 455,000. If BDSA had said production including foreign holdings of U. S. companies, and consumption instead of demand, they might have seen their prediction come true. But as the statement stands there is little chance of its being correct. Consumption does not take into consideration the aim of fabricators and manufacturers to rebuild their badly depleted inventories. Thus demand is most likely to be in excess of supply. If the three conditions set by BDSA hold, the situation will definitely ease up.

All's Not Well

Things are running smoothly enough in this country right now. But all is still not well in Chile from whence Anaconda primarily and to a lesser degree Kennecott depend for a vital portion of their ore. President Ibanez recently settled strikes of government workers and of miners. Power rather than arbitration was basically responsible so the situation is far from predictable.

An instance highlighting the critical state of Chile's economy in general was the news that the stock exchange in Santiago, the capital city, had to close its doors to halt a panic after a government change in margin requirements.

Aluminum producers were informed by ODM Chief Flemming that they would soon be told how much of their metal they would have to deliver to the national stockpile for the first quarter 1956. The maximum would be 100,000 tons. While not as bad as copper, the aluminum market is still quite tight and it is expected that continued deferments will be made. Production in 1955 thus far has increased in an attempt to meet the increasing demand. Through August 1,026,080 tons of aluminum were produced as compared with 966,857 in a like period in 1954.

Nickel consumers received the best news from ODM with announcement that 2.5 million lb of nickel would be deducted from deliveries to the stockpile for industry in October.

Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	Sept. 28	Sept. 29	Sept. 30	Oct. 1	Oct. 3	Oct. 4
Copper, electro, Conn.	43.00	43.00	43.00	....	43.00	43.00
Copper, Lake, delivered	43.00	43.00	43.00	....	43.00	43.00
Tin, Straits, New York	96.75	96.75	96.75	96.625	96.25	96.25*
Zinc, East St. Louis	13.00	13.00	13.00	13.00	13.00	13.00
Lead, St. Louis	15.30	15.30	15.30	15.30	15.30	15.30

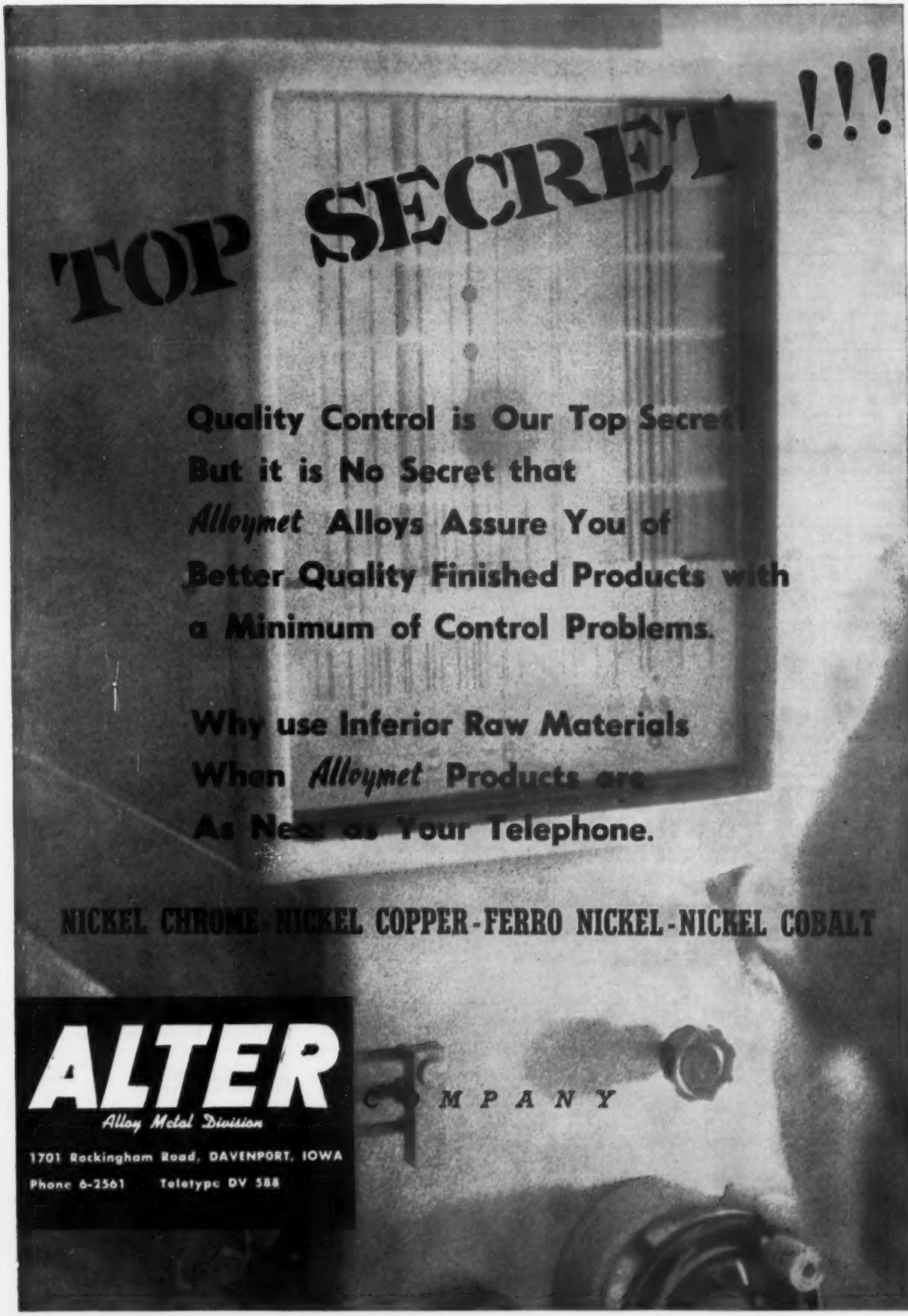
Monthly Average Metal Prices

(Cents per lb except as noted)

Average prices of the major nonferrous metals in September based on quotations appearing in THE IRON AGE, were as follows:

Electrolytic copper		Straits tin, New York	96.481
Del'd Conn. Valley	43.00	Zinc, E. St. Louis	12.903
Lake copper, delivered	43.00	Lead, St. Louis	14.937

Note: Quotations are going prices **Tentative*


TOP SECRET !!!
Quality Control is Our Top Secret!
But it is No Secret that
Alloymet Alloys Assure You of
Better Quality Finished Products with
a Minimum of Control Problems.
Why use Inferior Raw Materials
When Alloymet Products are
As Near as Your Telephone.
NICKEL CHROME-NICKEL COPPER-FERRO NICKEL-NICKEL COBALT
ALTER
Alloy Metal Division
1701 Rockingham Road, DAVENPORT, IOWA
Phone 6-2561 Teletype DV 588
COMPANY

Nonferrous Prices *(Effective Oct. 4, 1955)*

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate

("F" temper except 6061-0)

Alloy	.032	.081	.126–.249	.250–3.
1100, 3003	40.8	38.7	37.5	36.5
5052	48.3	43.4	41.7	39.9
6061–0	45.4	41.2	39.4	39.3

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6– 8	41.6–43.3	56.6–60.2
12–14	42.3–43.7	57.5–61.8
24–26	45.3–45.7	67.7–72.1
36–38	53.6–54.2	90.5–94.3

Screw Machine Stock—2011-T-3

Size*	¼	⅜–⅝	¾–1	1¼–1½
Price	54.5	53.4	52.1	50.1

Roofing Sheet, Corrugated

(Per sheet, 26" wide, base, 16,000 lb)

Length "l ▶	72	96	120	144
.019 gage	$1.295	$1.727	$2.160	$2.590
.024 gage	1.615	2.162	2.692	3.232

Magnesium

(F.o.b. mill, freight allowed)

Sheet & Plate: FS1-O ¼ in., 61¢; 5/16 in., 62¢; ⅜ in., 61¢; 0.064 in., 78¢; 0.032 in., 99¢. Specification grade higher. Base, 30,000 lb.

Extruded Round Rod: FS, diam ⅛ to 0.311 in., 82.5¢; ⅜ to ⅝ in., 65¢; 1¼ to 1.749 in., 60.5¢; 2½ to 5 in., 57¢. Other alloys higher. Base up to ⅝ diam, 10,000 lb; ⅝ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes: Rectangles: FS. In weight per ft for perimeters less than size indicated: 0.19 to 0.11 lb, 3.5 in., 70.7¢; 0.22 to 0.25 lb, 5.9 in., 66.9¢; 0.50 to 0.59 lb, 8.6 in., 63¢; 1.8 to 2.59 lb, 19.5 in., 60.5¢; 4 to 6 lb, 28 in., 57.7¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: FS, 0.049 to 0.057 in. wall thickness: OD ¼ to 5/16 in., $1.625; 5/16 to ⅜ in., $1.475; ½ to ⅝ in., $1.105; 1 to 2 in., 92.5¢; 0.165 to 0.219 in. wall: OD, ⅝ to ⅞ in., 75.5¢; 1 to 2 in., 71.5¢; 2 to 4 in., 70.5¢. Other alloys higher. Base OD: Up to 1½ in., 10,000 lb; 1½ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	54.79	....	58.56
Copper, h-r	53.76	55.11	....
Copper, drawn	....	56.36	....
Low brass	53.15	53.09	....
Yellow brass	49.27	49.21	....
Red brass	54.54	54.48	....
Naval brass	52.83	47.14	48.40
Leaded brass	....	....	45.74
Com. bronze	56.48	56.42	....
Mang. bronze	56.57	50.67	52.23
Phos. bronze	77.14	77.64	....
Munts metal	50.94	46.75	48.00
Ni silver, 10 pct	63.05	66.13	68.50
Beryllium copper, CR, 1.9% Be, Base 2000 lb, f.o.b. Strip			$1.84
Rod, bar, wire			1.81

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	102	78	99
Strip, CR	102	87	125
Rod, Bar, HR	87	69	93
Angles, HR	87	69	93
Plate, HR	97	82	95
Seamless Tube	122	108	153
Shot, Blocks	....	85	....

Titanium

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $14.00-$14.50; alloy $16.50; Plate, HR, commercially pure, $11.50-$12.00; alloy, $12.50-$12.75; Wire, rolled and/or drawn, commercially pure, $10.50-$11.00; alloy, $12.50; Bar, HR or forged, commercially pure, $8.50-$8.75; alloy, $8.50-$9.00.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	24.40
Aluminum pig	22.50
Antimony, American, Laredo, Tex.	33.50
Beryllium copper, per lb conta'd Be	$43.00
Beryllium aluminum 5% Be, Dollars per lb contained Be	$72.75
Bismuth, ton lots	$2.25
Cadmium, del'd	$1.70
Cobalt, 97-99% (per lb)	$2.60 to $2.67
Copper, electro, Conn. Valley	43.00
Copper, Lake, delivered	43.00
Gold, U. S. Treas., per troy oz.	$35.00
Indium, 99.9%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$100 to $120
Lead, St. Louis	15.30
Lead, New York	15.50
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb, pig	32.50
ingot	33.25
Magnesium, sticks, 100 to 500 lb	53.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$274 to $278
Nickel electro	64.50
Nickel oxide sinter, at Copper Cliff, Ont., contained nickel	60.75
Palladium, dollars per troy oz.	$22 to $24
Platinum, dollars per troy oz.	$91 to $95
Silver, New York, cents per troy oz.	91.875
Tin, New York	96.25
Titanium, sponge, grade A-1	$2.95
Zinc, East St. Louis	13.00
Zinc, New York	13.50
Zirconium, sponge	$7.50 to $10.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	42.50
No. 120	42.00
No. 123	41.50
80-10-10 ingot	
No. 305	45.75
No. 315	44.00
88-10-2 ingot	
No. 210	59.25
No. 215	55.25
No. 245	48.75
Yellow ingot	
No. 405	34.75
Manganese bronze	
No. 421	38.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper max.	31.25-32.50
0.60 copper max.	31.00-32.25
Piston alloys (No. 122 type)	31.00-32.25
No. 12 alum. (No. 2 grade)	30.00-31.00
108 alloy	30.00-31.00
195 alloy	31.25-32.00
13 alloy (0.60 copper max.)	31.50-32.75
AXS-679	30.00-31.00

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½%	30.50-31.50
Grade 2—92-95%	29.50-30.50
Grade 3—90-92%	28.50-29.50
Grade 4—85-90%	28.00-29.00

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	39	38¼
Yellow brass	28⅞	26¾
Red brass	34½	33½
Comm. bronze	35⅝	35
Mang. bronze	27	25¾
Yellow brass rod ends	28⅝	

Custom Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	43
No. 2 copper wire	41½
Light copper	39
*Refinery brass	38½

* Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	43
No. 2 copper wire	41½
Light copper	39
No. 1 composition	35
No. 1 comp. turnings	34½
Rolled brass	26
Brass pipe	26½
Radiators	28
Aluminum	
Mixed old cast	19½—20½
Mixed new clips	20½—21½
Mixed turnings, dry	19½—21

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	39½—40½
No. 2 heavy copper and wire	38½—39½
Light copper	35½—36½
New type shell cuttings	36 —37
Auto radiators (unsweated)	24 —24½
No. 1 composition	30 —31
No. 1 composition turnings	29 —30
Unlined red car boxes	23 —24
Cocks and faucets	25½—26½
Mixed heavy yellow brass	21 —22
Old rolled brass	22½—23
Brass pipe	26 —27
New soft brass clippings	25½—26½
No. 1 brass rod turnings	23 —23½

Aluminum

Alum. pistons and struts	17 —17½
Aluminum crankcases	17 —17½
1100 (2S) aluminum clippings	19 —19½
Old sheet and utensils	17 —17½
Borings and turnings	10½—11
Misc. cast aluminum	17 —17½
2024 (24s) clippings	18 —18½

Zinc

New zinc clippings	8 — 8½
Old zinc	5½— 6
Zinc routings	4
Old die cast scrap	3½

Nickel and Monel

Pure nickel clippings	92
Clean nickel turnings	75
Nickel anodes	92
Nickel rod ends	92
New Monel clippings	54½
Clean Monel turnings	44
Old sheet Monel	50
Nickel silver clippings, mixed	23
Nickel silver turnings, mixed	19

Lead

Soft scrap lead	11½—12
Battery plates (dry)	6½— 6¾
Batteries, acid free	4½

Magnesium

Segregated solids	18½—19
Castings	17½—18

Miscellaneous

Block tin	80 —81
No. 1 pewter	64
Auto babbitt	42 —43
Mixed common babbitt	14½
Solder joints	17½—20
Siphon tops	43
Small foundry type	16½
Monotype	15
Lino. and stereotype	14 —14½
Electrotype	12 —12½
Hand picked type shells	10⅝
Lino. and stereo. dross	5½
Electro dross	5

IRON AGE

STEEL PRICES

(Effective Oct. 4, 1955)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$96.00 *B3*		4.65 *B3*	6.00 *B3*	4.65 *B3*						
	Buffalo, N. Y.	$68.50 *B3*	$84.50 *R3, B3*	$96.00 *R3, B3*	5.45 *B3*	4.65 *B3*	6.00 *B3*	4.65 *B3*	4.325 *R3,B3*	6.25 *B3* 6.25 *R7,S10*	6.425 *B3*	9.10 *B3*		
	Claymont, Del.													
	Harrison, N. J.													13.45 *C11*
	Conshohocken, Pa.								4.375 *A2*	6.30 *A2*	6.425 *A2*			
	New Bedford, Mass.									6.70 *R6*				
	Johnstown, Pa.	$68.50 *B3*	$84.50 *B3*	$96.00 *B3*		4.65 *B3*	6.00 *B3*							
	Boston, Mass.									6.80 *T8*				13.80 *T8*
	New Haven, Conn.									6.70 *D1* 7.90 *A5*				
	Phoenixville, Pa.					5.15 *P2*		5.15 *P2*						
	Sparrows Pt., Md.								4.325 *B3*	6.25 *B3*	6.425 *B3*	9.10 *B3*		
	Bridgeport, Wallingford, Conn.	$73.50 *N8*	$89.50 *N8*						4.625 *N8*	6.70 *W1*			7.50 *N8*	
	Pawtucket, R. I. Worcester, Mass.									6.80 *N7* 7.10 *A5*				*A5* 13.80 *N7*
MIDDLE WEST	Alton, Ill.								4.50 *L1*					
	Ashland, Ky.								4.325 *A7*					
	Canton-Massillon, Dover, Ohio		$86.50 *R3*	$96.00 *R3*										13.45 *G4*
	Chicago, Ill.	$68.50 *UI*	$84.50 *R3, UI,W8*	$96.00 *R3, UI,W8*	5.45 *UI*	4.60 *UI, W8*	6.75 *UI, Y1*	4.60 *UI*	4.325 *A1, N4,W8*	6.35 *A1,T8*			7.20 *W8*	13.45 *T8*
	Cleveland, Ohio									6.25 *A5,J3*		9.30 *A5*		13.45 *A5*
	Detroit, Mich.			$96.00 *R5*					4.425 *G3,M2*	6.35 *D1,D2, G3,M2,P11*	6.525 *G3*	9.20 *D2, G3*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$68.50 *UI*	$84.50 *UI*	$96.00 *UI, Y1*	5.45 *I3*	4.60 *UI, I3*	6.75 *UI, I3*		4.325 *I3, UI,Y1*	6.35 *I3* 6.25 *Y1*	6.425 *I3, UI,Y1*	9.30 *Y1*	7.20 *Y1, UI*	
	Sterling, Ill.								4.425 *N4*					
	Indianapolis, Ind.									6.40 *C5*				
	Newport, Ky.												7.20 *N5*	
	Middletown, Ohio									6.45 *A7*				
	Niles, Warren, Ohio Sharon, Pa.	$68.50 *C10*	$84.50 *C10*	$96.00 *C10*					4.325 *S1, R3*	6.25 *S1, R3,T4*	6.425 *S1, R3*	9.10 *S1, R3*	7.20 *S1*	13.45 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$68.50 *UI, J3*	$84.50 *J3, UI,C11*	$96.00 *UI, C11*	5.45 *UI*	4.60 *UI, J3*	6.75 *UI, J3*	4.60 *UI*	4.325 *P6*	6.25 *S7,B4*			7.20 *S9*	13.45 *S9*
	Portsmouth, Ohio								4.325 *P7*	6.25 *P7*				
	Weirton, Wheeling, Follansbee, W. Va.					4.60 *W3*			4.325 *W3*	6.25 *F3,W3*	6.425 *W3*	9.10 *W3*		
	Youngstown, Ohio		$84.50 *C10*	$96.00 *Y1, C10*		4.60 *Y1*	6.75 *Y1*		4.325 *UI, Y1*	6.25 *Y1,C5*	6.425 *UI, Y1*	9.30 *Y1*	7.20 *UI, Y1*	13.45 *C5*
WEST	Fontana, Cal.	$76.00 *K1*	$92.00 *K1*	$115.00 *K1*		5.25 *K1*	7.40 *K1*	5.40 *K1*	5.075 *K1*	8.00 *K1*	7.525 *K1*		8.85 *K1*	
	Geneva, Utah		$84.50 *C7*			4.60 *C7*	6.75 *C7*							
	Kansas City, Mo.					4.70 *S2*	6.85 *S2*				6.675 *S2*		7.45 *S2*	
	Los Angeles, Torrance, Cal.		$94.00 *B2*	$116.00 *B2*		5.30 *C7, B2*	7.45 *B2*		5.075 *C7, B2*	8.30 *C1*			8.40 *B2*	
	Minnequa, Colo.					4.90 *C6*			5.425 *C6*					
	Portland, Ore.					5.35 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$94.00 *B2*			5.25 *B2, P9*	7.40 *B2*		5.075 *B2, C7*					
	Seattle, Wash.		$98.00 *B2*			5.35 *B2*	7.50 *B2*		5.325 *B2*					
SOUTH	Atlanta, Ga.								4.525 *A9*					
	Fairfield, Ala. City, Birmingham, Ala.	$68.50 *T2*	$84.50 *T2*			4.60 *C16, R3,T2*	6.75 *T2*		4.325 *R3, C16,T2*		6.425 *T2*			
	Houston, Lone Star, Tex.	$74.50 *L3*	$89.50 *S2*	$101.00 *S2*		4.70 *S2*	6.85 *S2*				6.675 *S2*		7.45 *S2*	

IRON AGE

STEEL PRICES

(Effective Oct. 4, 1955)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled 10 ga. & hvyr.	Cold-rolled	Galvanized 10 ga.	Enameling 12 ga.	Long Terne 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Hollowware Enameling 29 ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.325 *B3*	5.325 *B3*				6.375 *B3*	7.875 *B3*			*W6*	† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Coa-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25-lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	4.375 *A2*	5.375 *A2*				6.425 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										5.025 *B3*			
	Fairless, Pa.	4.375 *UI*	5.375 *UI*				6.425 *UI*	7.925 *UI*				$9.30 *UI*	$8.00 *UI*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.325 *B3*	5.325 *B3*	5.85 *B3*			6.375 *B3*	7.875 *B3*	8.60 *B3*		5.125 *B3*	$9.30 *B3*	$8.00 *B3*	
	Worcester, Mass.										5.325 *A3*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										5.20 *L1*			
	Ashland, Ky.	4.325 *A7*		5.85 *A7*	5.90 *A7*									
	Canton-Massillon, Dover, Ohio			5.85 *R1, R3*										
	Chicago, Joliet, Ill.	4.325 *A1, W8*					6.375 *UI*				5.025 *A5, N4 R3*			
	Sterling, Ill.										5.125 *N4*			
	Cleveland, Ohio	4.325 *J3, R3*	5.325 *J3, R3*		5.90 *R3*		6.375 *J3, R3*	7.875 *J3, R3*			5.025 *A5*			
	Detroit, Mich.	4.425 *G3, M2*	5.425 *G3* 5.325 *M2*				6.475 *G3*	7.975 *G3*						
	Newport, Ky.	4.325 *N5*	5.325 *N5*	5.85 *N5*										
	Gary, Ind. Harbor, Indiana	4.325 *I3, UI, YI*	5.325 *I3, UI, YI*	5.85 *UI, I3*	5.90 *UI, I3*	6.25 *UI*	6.375 *YI, UI, I3*	7.875 *UI, YI*			5.025 *YI*	$9.20 *I3, UI, YI*	$7.90 *I3, UI, YI*	6.65 *UI, YI*
	Granite City, Ill.	4.525 *G2*	5.525 *G2*	6.05 *G2*	6.10 *G2*								$8.00 *G2*	6.75 *G2*
	Kokomo, Ind.	4.425 *C9*		5.95 *C9*						5.475 *C9*	5.125 *C9*			
	Mansfield, Ohio	4.325 *E2*	5.325 *E2*			6.25 *E2*				*E2*				
	Middletown, Ohio		5.325 *A7*	5.85 *A7*	5.90 *A7*	6.25 *A7*								
	Niles, Warren, Ohio Sharon, Pa.	4.325 *S1, R3, N3*	5.325 *R3, N3*	5.85 *R3* 5.85 *N3*	5.90 *N3*	6.25 *N3*	6.375 *S1, R3*	7.875 *R3*				$9.20 *R3*	$7.90 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.325 *J3, UI, P6*	5.325 *J3, UI, P6*	5.85 *UI*	5.90 *UI, A7*		6.375 *J3, UI*	7.875 *UI*	8.60 *UI*		5.025 *A5, P6*	$9.20 *J3, UI*	$7.90 *J3, UI*	6.65 *UI*
	Portsmouth, Ohio	4.325 *P7*	5.325 *P7*								5.025 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.325 *W3, W5*	5.325 *W3, W5, F3*	5.85 *W3, W5*		6.25 *W3, W5*	6.375 *W3*	7.875 *W3*				$9.20 *W3, W5*	$7.90 *W3, W5*	6.65 *F3, W5*
	Youngstown, Ohio	4.325 *UI, YI*	5.325 *YI*		5.90 *YI*		6.375 *UI, YI*	7.875 *YI*			5.025 *YI*			
WEST	Fontana, Cal.	5.075 *K1*	6.425 *K1*				7.125 *K1*	8.975 *K1*						
	Geneva, Utah	4.425 *C7*												
	Kansas City, Mo.										5.275 *S2*			
	Los Angeles, Torrance, Cal.										5.025 *B2*			
	Minnequa, Colo.										5.275 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.025 *C7*	6.275 *C7*	6.60 *C7*							5.075 *C7*	$9.95 *C7*	$8.65 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.325 *R3, T2*	5.325 *T2*	5.85 *R3, T2*			6.375 *T2*			5.625 *R3*	5.025 *R3, T2*	$9.20 *T2*	$8.00 *T2*	
	Houston, Tex.										5.275 *S2*			

IRON AGE

STEEL PRICES

(Effective Oct. 4, 1955)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				5.575 *B3*	7.425 *B3*	6.80 *B3*					
	Buffalo, N. Y.	4.65 *B3,R3*	4.65 *B3,R3*	5.95 *B5*	5.575 *B3,R3*	7.425 *B3,B5*	6.80 *B3*	4.50 *B3,R3*				6.25 *W6*
	Claymont, Del.							4.50 *C4*		6.30 *C4*		
	Coatesville, Pa.							4.50 *L4*		6.30 *L4*	6.725 *L4*	
	Conshohocken, Pa.							4.50 *A2*	5.575 *A2*		6.725 *A2*	
	Harrisburg, Pa.							5.10 *C3*	5.575 *C3*			
	Hartford, Conn.			6.40 *R3*		7.725 *R3*						
	Johnstown, Pa.	4.65 *B3*	4.65 *B3*		5.575 *B3*		6.80 *B3*	4.50 *B3*		6.30 *B3*	6.725 *B3*	6.25 *B3*
	Fairless, Pa.	4.80 *U1*	4.80 *U1*		5.725 *U1*							
	Newark, N. J.			6.35 *W10*		7.60 *W10*						
	Camden, N. J.			6.35 *P10*								
	Bridgeport, Putnam, Conn.	4.80 *N8*		6.45 *W10*	5.725 *N8*			4.750 *N8*				
	Sparrows Pt., Md.		4.65 *B3*					4.50 *B3*		6.30 *B3*	6.725 *B3*	6.35 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			6.35 *W11* 6.45 *B5,C14*		7.725 *A5,B5*		4.50 *R3*				6.55 *A5, W6*
MIDDLE WEST	Alton, Ill.	4.85 *L1*										6.425 *L1*
	Ashland, Newport, Ky.							4.50 *A7,N5*		6.30 *N5*		
	Canton-Massillon, Mansfield, Ohio	4.75 *R3*		5.90 *R2,R3*	5.575 *R3,T5*	7.425 *R2,R3, T5*		4.50 *E2*				
	Chicago, Joliet, Ill.	4.65 *U1, N4,W8,R3, P13*	4.65 *N4,R3, P13*	5.90 *A5,W10, W8,B5,L2*	5.575 *U1,R3, W8*	7.425 *A5,W8, W10,L2,B5*		4.50 *U1,W8, I3,A1,R3*	5.575 *U1*	6.30 *U1*	6.725 *U1*	6.25 *A5,R3, N4,W7*
	Cleveland, Ohio	4.65 *R3*	4.65 *R3*	5.90 *A5,C13*		7.425 *A5,C13*	6.80 *R3*	4.60 *J3,R3*	5.575 *J3*		6.725 *R3,J3*	6.25 *A5, C13*
	Detroit, Mich.	4.75 *G3*	4.75 *G3*	5.90 *R5* 6.10 *B5,P8* 6.15 *P3*	5.575 *R5* 5.675 *G3*	7.425 *R5* 7.625 *B5,P3 P8*	6.90 *G3*	4.60 *G3*			6.825 *G3*	
	Duluth, Minn.											6.25 *A5*
	Gary, Ind. Harbor, Crawfordsville	4.65 *I3, U1, Y1*	4.65 *I3, U1, Y1*	5.90 *M5,R3*	5.575 *I3, U1, Y1*	7.425 *M5, R3*	6.80 *U1,I3, Y1*	4.50 *I3, U1,Y1*	5.575 *I3*	6.30 *U1,Y1*	6.725 *U1,I3, Y1*	6.35 *M4*
	Granite City, Ill.							4.70 *G2*				
	Kokomo, Ind.											6.35 *C9*
	Sterling, Ill.	4.75 *N4*	4.75 *N4*									6.35 *N4*
	Niles, Warren, Ohio Sharon, Pa.	4.65 *R3,C10*		5.90 *C10*	5.575 *C10*	7.425 *C10*	6.80 *R3*	4.50 *S1,R3*		6.30 *S1*	6.725 *S1*	
	Pittsburgh, Pa. Midland, Pa.	4.65 *J3, U1, C11*	4.65 *J3, U1*	5.90 *A5,C8, C11,J3, W10,B4,R3*	5.575 *U1,C11*	7.425 *A5,C11, W10,C8,R3*	6.80 *J3, U1*	4.50 *J3, U1*	5.575 *U1*	6.30 *U1*	6.725 *J3, U1*	6.25 *A5,J3, P6*
	Portsmouth, Ohio											6.25 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	4.65 *W3*						4.50 *W3,W5*				
	Youngstown, Ohio	4.65 *U1, Y1, C10,R3*	4.65 *U1, Y1, R3*	5.90 *Y1, U1*	5.575 *U1, Y1, C10*	7.425 *Y1,C10* 7.625 *F2*	6.80 *U1, Y1*	4.50 *U1, Y1, R3*		6.30 *Y1*	6.725 *Y1*	6.25 *Y1*
WEST	Emeryville, Cal.	5.40 *J5*	5.40 *J5*									
	Fontana, Cal.	5.35 *K1*	5.35 *K1*		6.625 *K1*		7.50 *K1*	5.15 *K1*		6.95 *K1*	7.375 *K1*	
	Geneva, Utah							4.50 *C7*			6.725 *C7*	
	Kansas City, Mo.	4.90 *S2*	4.90 *S2*		5.825 *S2*		7.05 *S2*					6.50 *S2*
	Los Angeles, Torrance, Cal.	5.35 *B2,C7*	5.35 *B2,C7*	7.35 *R3*	6.625 *B2*		7.50 *B2*				7.625 *B2*	7.20 *B2*
	Minnequa, Colo.	5.10 *C6*	5.10 *C6*					5.35 *C6*				6.50 *C6*
	Portland, Ore.	5.40 *O2*	5.40 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	5.35 *C7* 5.40 *B2,P9*	5.35 *C7* 5.40 *B2,P9*				7.55 *B2*					7.20 *C7*
	Seattle, Wash.	5.40 *B2,P12, N6*	5.40 *B2,P12*				7.55 *B2*	5.40 *B2*		7.20 *B2*	7.625 *B2*	
SOUTH	Atlanta, Ga.	4.85 *A8*	4.85 *A8*									6.45 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	4.65 *T2,C16, R3*	4.65 *T2,C16, R3*				6.90 *T2*	4.50 *T2,R3*			6.725 *T2*	6.25 *R3, T2*
	Houston, Ft. Worth, Lone Star, Tex.	4.90 *S2*	4.90 *S2*		5.825 *S2*		7.05 *S2*	4.85 *L3* 4.40 *S2*		6.40 *S2*	6.825 *S2*	6.50 *S2*

Steel Prices *(Effective Oct. 4, 1955)*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.
D5 Henry Disston & Sons, Inc., Philadelphia

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

Globe Iron Co., Jackson, O.

G1 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp, Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Div., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N.
P11 Production Steel Strip Corp., Detroit
P12 Pacific Steel Rolling Mills, Seattle
P13 Phoenix Mfg. Co., Joliet, Ill.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass
R7 Rome Strip Steel Co., Rome, N. Y

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo

T1 Tonawanda Iron Div., N. Tonawanda, N. Y
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W11 Worcester Pressed Steel Co., Worcester, Mass

Y1 Youngstown Sheet & Tube Co., Youngstown

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $290 per net ton

ARD T. & C.	BUTTWELD														SEAMLESS							
	⅛ In.		¼ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	15.50	0.25	18.50	4.25	21.00	7.75	23.50	8.50	24.00	9.50	24.50	10.00	26.00	9.75								
Youngstown *R3*	17.50	0.25	20.50	4.25	23.00	7.75	25.50	9.00	26.00	10.00	26.50	10.50	28.00	10.75								
Fontana *K1*	6.00	+0.25	9.00	+5.25	11.50	+1.75	14.00	+1.00	14.50	+0.00	15.00	0.50	16.50	0.25								
Pittsburgh *J3*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75	14.50	+2.25
Alton, Ill. *L1*	16.50	0.25	18.50	4.25	21.00	7.75	23.50	8.50	24.00	9.50	24.50	10.00	26.00	9.75								
Sparrows *M3*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75								
Fairless *N2*	16.50	0.25	18.50	4.25	21.00	7.75	23.50	8.50	24.00	9.50	24.50	10.00	26.00	9.75								
Pittsburgh *N1*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75	14.50	+2.25
Wheeling *W5*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75								
Weirtland *W4*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75	14.50	+2.25
Youngstown *Y1*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75								
Indiana Harbor *Y1*	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75								
Lorain *N2*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75	14.50	+2.25
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	20.0	6.25	24.00	10.25	26.00	13.75	26.50	12.50	27.00	13.50	27.50	14.00	28.00	12.75								
Youngstown *R3*	22.0	6.25	26.00	10.25	28.00	13.75	28.50	13.00	29.00	14.00	29.50	14.50	30.00	13.75								
Fairless *N2*	20.0	6.25	24.00	10.25	26.00	13.75	26.50	12.50	27.00	13.50	27.50	14.00	28.00	12.75								
Fontana *K1*	10.50		14.50		16.50		17.00		17.50		18.00		18.50									
Pittsburgh *J3*	22.00	0.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75
Alton, Ill. *L1*	20.0	6.25	24.00	10.25	26.00	13.75	26.50	12.50	27.00	13.50	27.50	14.00	28.00	12.75								
Sharon *M3*	22.0	0.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75								
Pittsburgh *N1*	22.0	0.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75
Wheeling *W5*	22.0	0.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75								
Weirtland *W4*	22.0	0.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75								
Youngstown *Y1*	22.0	0.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75
Indiana Harbor *Y1*	21.0	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75								
Lorain *N2*	22.0	0.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75

Threads only, buttweld and seamless 2½ pt higher discount. Plain ends, buttweld and seamless, 3-in. and under, 4½ pt higher discount. Buttweld jobbers discount, 5 pct. Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb, East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2 in., 1½ pt.; 2½ and 3-in., 1 pt. e.g., zinc price range of over 11¢ to 13¢ would lower discounts; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.00¢ per lb.

Steel Prices *(Effective Oct. 4, 1955)*

To identify producers, see Key on preceding page

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *UI*	4.725	5.65	5.825	....	....	....	....
So. Chicago *R3*	....	....	....	7.50	....	....	....
Ensley *T2*	4.725	5.65	....	....	....	....	....
Fairfield *T2*	....	5.65	....	7.50	....	5.625	....
Gary *UI*	4.725	5.65	....	....	....	5.625	....
Ind. Harbor *I3*	4.725	....	5.825	7.50	....	5.525	....
Johnstown *B3*	....	5.65	....	....	....	....	....
Joliet *UI*	....	5.65	5.825	....	....	....	....
Kansas City *S2*	....	....	....	7.90	....	....	....
Lackawanna *B3*	4.725	5.65	5.825	....	....	5.625	....
Minnequa *C6*	4.725	6.15	5.825	7.50	....	5.625	12.40
Pittsburgh *O1*	....	....	....	....	11.90	....	12.40
Pittsburgh *P5*	....	....	....	....	....	....	12.40
Pittsburgh *J3*	....	....	....	7.90	....	....	....
Seattle *B4*	....	....	....	8.40	....	5.775	12.90
Steelton *B3*	4.725	....	5.825	....	....	5.625	....
Struthers *Y1*	....	....	....	7.90	....	....	....
Torrance *C7*	....	....	....	....	....	5.775	....
Williamsport *S5*	....	5.65	....	....	....	....	....
Youngstown *R3*	....	....	....	7.90	....	....	....

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	8.40	8.60	....
Armature	9.35	9.60	10.10
Elect.	9.95	10.20	10.70
Motor	10.95	11.20	11.70
Dynamo	11.85	12.10	12.60
Trans. 72	12.80	13.05	13.55
Trans. 65	13.35	Grain Oriented	
Trans. 58	13.85	Trans. 80	17.45
Trans. 52	14.85	Trans. 73	17.95

Producing points: Beech Bottom *(W5)*; Brackenridge *(A3)*; Granite City *(G2)*; Indiana Harbor *(I3)*; Mansfield *(E2)*; Newport, Ky. *(N5)*; Niles, O. *(N3)*; Vandergrift *(U1)*; Warren, O. *(R3)*; Zanesville *(A7)*.
* Coils 75¢ higher.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Woven Wire Fence 9–15½ ga. Col	"T" Fence Post's Col	Single Loop Bale Ties Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Annl'd ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	152 162	...	173 175	7.40	7.80
Aliquippa, Pa. *J3*	152 162	...	....	7.40	7.80
Atlanta *A8*	154 167	...	175 180	7.50	8.025
Bartonville *K2**	154 168	...	175 181	7.50	8.075
Buffalo *W6*	....	...	....	7.40	7.80
Chicago, Ill. *N6***	152 166	...	173 179	7.40	8.00
Cleveland *A6*	157	...	....	7.40	....
Cleveland *A5*	....	...	....	7.40	....
Crawfordsville *M6**	154 167	...	175 175	7.50	8.05
Donora, Pa. *A5*	152 162	...	173 175	7.40	7.80
Duluth *A5*	152 162	...	173 175	7.40	7.80
Fairfield, Ala. *T2*	152 162	...	173 175	7.40	7.80
Galveston *D4*	157	...	....	....	....
Houston *S2*	167 170	...	 180	7.65	8.05
Johnstown, Pa. *B3**	152 166	...	 175	7.40	7.80
Joliet, Ill. *A5*	152 162	...	173 175	7.40	7.80
Kokomo, Ind. *C9*	154 154	...	175 177	7.50	7.90
Los Angeles *B2**	....	...	....	8.35	8.925
Kansas City *S2*	167 174	...	178 180	7.65	8.05
Minnequa *C6*	157 167	162	178 180	7.65	8.05
Monessen *P6*	152 162	...	....	7.40	7.80
Moline, Ill. *R3*	 162	162	....	....	....
Pittsburgh, Cal. *C7*	171 185	...	 195	8.35	8.75
Portsmouth *P7*	....	...	....	7.40	....
Rankin, Pa. *A5*	152 162	...	 175	7.40	7.80
So. Chicago *R3*	152 162	157	173 175	7.40	7.80
S. San Francisco *C6*	....	...	197 195	8.35	8.75
Sparrows Pt. *B3**	154	...	175 181	7.50	8.075
Struthers, O. *Y1*	....	...	....	7.40	7.90
Worcester *A5*	158	...	....	7.70	....
Williamsport, Pa. *S5*	....	160	....	....	....

Galvanized products computed with zinc at 5¢ per lb. Exceptions: *zinc at 12.5¢ per lb; **13¢ zinc.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Buffalo, N. Y. *R7*	7.00	8.95	10.50	12.65	15.35
Carnegie, Pa. *S9*	....	8.95	10.50	12.65	15.35
Cleveland *A5*	7.00	8.95	10.50	12.65	15.35
Detroit *D1*	7.10	9.05	10.60	12.75	....
Detroit *D2*	7.10	9.05	10.60	....	....
Harrison, N. J. *C11*	....	....	10.80	12.95	15.65
Indianapolis *C5*	7.15	9.10	10.50	12.65	15.35
New Castle, Pa. *B4*	7.00	8.95	10.50	12.65	....
New Haven, Conn. *D1*	7.45	9.25	10.80	12.95	....
Pawtucket, R. I. *N7*	7.55	9.25	10.80	12.95	15.65
Pittsburgh *S7*	7.00	8.95	10.50	12.65	15.35
Riverdale, Ill. *A1*	7.10	8.95	10.50	12.65	15.35
Sharon, Pa. *S1*	7.00	8.95	10.50	12.65	15.35
Trenton *R4*	....	....	....	....	....
Wallingford *W1*	7.45	9.25	10.80	12.95	15.65
Warren, Ohio *T4*	7.00	8.95	10.50	12.65	15.35
Weirton, W. Va. *W3*	7.10	8.95	10.50	....	....
Worcester, Mass. *A5*	7.85	9.25	10.80	12.95	15.65
Youngstown *C5*	7.00	8.95	10.50	12.65	15.35

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	30.87	36.51	29.94	....
	2½	12	41.57	49.16	40.31	....
	3	12	47.99	56.76	46.54	....
	3½	11	56.03	66.27	54.34	....
	4	10	74.41	88.00	72.16	....
National Tube	2	13	30.87	36.51	29.94	....
	2½	12	42.57	49.16	40.31	....
	3	12	47.99	56.76	46.54	....
	3½	11	56.03	66.27	54.34	....
	4	10	74.41	88.00	72.16	....
Pittsburgh Steel	2	13	30.87	36.51	....	....
	2½	12	41.57	49.16	....	....
	3	12	47.99	56.76	....	....
	3½	11	56.03	66.27	....	....
	4	10	74.41	88.00	....	....

WAREHOUSES

Base price, f.o.b., dollars per 100 lb.

Ohio City	Ohio City Delivery Charge	Sheets Hot-Rolled	Sheets Cold-Rolled	Sheets Galvanized (18 gage)	Strip Hot-Rolled	Strip Cold-Rolled	Plates	Shapes Standard Structural	Bars Hot-Rolled	Bars Cold-Finished	Alloy Bars Hot-Rolled 4615 As rolled	Alloy Bars Hot-Rolled 4140 Annealed	Alloy Bars Cold-Drawn 4615 As rolled	Alloy Bars Cold-Drawn 4140 Annealed
Baltimore	$.10	7.83	8.32	9.10	7.65	.....	7.21	7.93	7.61	8.62	14.38	13.44–13.96	16.36	16.29–16.49
Birmingham	.15	6.80	7.93	8.85	7.06	.....	6.99	7.28	7.08	9.35	.....	.....	.....	.....
Boston	.10	7.78	8.81	10.27	7.94–7.96	10.30	7.89	8.13	7.83	9.53	13.45–13.89	13.40–13.45	16.65	16.50
Buffalo	.30	6.89	8.05	9.77	7.15	.....	7.15	7.40	7.10	7.90	.....	13.10	.....	16.15
Chicago	.25	6.80	8.34	8.50	7.06	.....	6.99	7.28	7.08	7.75	13.20	12.85	16.05	15.90
Cincinnati	.25	6.92	8.33	8.90	7.30	.....	7.28	7.75	7.32	8.05	13.44	13.09	16.29	16.14
Cleveland	.30	6.80	8.29	8.85	7.16	.....	7.16	7.61	7.14	7.85	.....	12.91	.....	15.96
Denver	.....	8.80	10.00	11.22	8.90	.....	8.60	8.75	8.90	9.82	.....	.....	.....	17.97
Detroit	.25	6.99	8.33	8.75	7.34	8.15	7.27	7.75	7.36	8.04	13.40	13.05	16.25	16.10
Houston	.....	7.85	8.75	10.49	8.15	.....	7.80	8.20	8.25	9.85–9.95	14.35	14.00	17.15	16.80
Kansas City	.29	7.47	8.60	9.17	7.73	.....	7.66	7.95	7.75	8.52	.....	13.52	.....	.....
Los Angeles	.10	8.05	10.00	11.00	8.35	.....	8.05	8.30	8.05	11.25	.....	14.25	.....	17.85
Memphis	.10	7.12	8.25	.....	7.38	.....	7.31	7.60	7.40	9.15	.....	.....	.....	.....
Milwaukee	.25	6.89	8.43	8.59	7.15	.....	7.08	7.45	7.17	7.94	.....	12.94	.....	15.99
New Orleans	.15	7.20	8.35	.....	7.45	.....	7.40	7.70	7.50	9.50	.....	.....	.....	.....
New York	.10	7.48	8.66	9.44	8.07	9.95	7.76	7.99	7.96	9.48	13.63	13.28	16.48	16.33
Norfolk	.20	7.25	.....	.....	7.65	.....	7.45	7.95	7.65	9.50	.....	.....	.....	.....
Philadelphia	.10	7.14	8.42	9.25	7.67	.....	7.37	7.74	7.64	8.46	13.51	13.16	16.36	16.21
Pittsburgh	.25	6.80	8.34	9.20	7.16	9.00	6.99	7.28	7.08	7.85	13.20	12.85	16.05	15.90
Portland	.....	7.80–8.60	8.80	10.65	8.00	.....	7.75	7.85–8.15	7.95	11.80	.....	15.00	.....	17.50
Salt Lake City	.20	.....	10.69	.....	9.35	.....	.....	9.20	9.15	.....	.....	.....	.....	.....
San Francisco	.10	8.10	9.65	10.15	8.35	.....	8.05	8.25	8.05	11.20*	.....	14.25	.....	17.85
Seattle	.60	8.55	10.60	10.80	8.65	.....	8.20	8.30	8.35	11.70	.....	14.60	.....	17.65
St. Louis	.25	7.09	8.63	9.19	7.35	.....	7.28	7.68	7.37	8.14	13.49	13.14	16.35	16.19
St. Paul	.25	7.46	8.58–9.14	9.16	7.72	.....	7.65	7.94	7.74	8.51	.....	13.51	.....	16.38

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.
Exceptions: (1) 1500 to 9999 lb. (2) 1000 lb or over. (3) $.25 delivery. (4) 1000 to 1999 lb, $.35 delivery.
* Plus analysis charge.

Miscellaneous Prices

(Effective Oct. 4, 1955)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb
18	4	1	—	—	$1.60
18	4	1	—	5	2.305
18	4	2	—	—	1.765
1.5	4	1.5	8	—	.96
6	4	3	6	—	1.35
6	4	2	5	—	1.105

High-carbon chromium	.77
Oil hardened manganese	.43
Special carbon	.39
Extra carbon	.33
Regular carbon	.275

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb. f.o.b.

		Plate (*A3, J2, L6*)			Sheet (*I7*)
	Cladding	10 pct	15 pct	20 pct	20 pct
Stainless Type	304	30.30	33.15	36.05	32.50
	316	35.50	38.45	41.40	47.00
	321	32.00	34.85	37.75	37.25
	347	34.40	37.90	41.40	48.25
	405	25.80	29.60	33.35	
	410, 430	25.30	29.10	32.85	

CR Strip (S9) Copper, 10 pct, 2 sides, 28.00; 1 side, 30.00.

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective for 1955 season.

	Gross Ton
Openhearth lump	$11.25
Old range, bessemer	10.40
Old range, nonbessemer	10.25
Mesabi, bessemer	10.25
Mesabi, nonbessemer	10.10
High phosphorus	10.00

COKE

Furnace, beehive (f.o.b. oven)	Net Ton
Connellsville, Pa.	$13.00 to $13.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	$16.00 to $16.50
Foundry, oven coke	
Buffalo, del'd	$28.08
Chicago, f.o.b.	25.75
Detroit, f.o.b.	26.25
New England, del'd	26.05
Seaboard, N. J., f.o.b.	25.50
Philadelphia, f.o.b.	25.00
Swedeland, Pa., f.o.b.	25.00
Plainesville, Ohio, f.o.b.	25.50
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.48
Cincinnati, del'd	26.56
St. Paul, f.o.b.	23.75
St. Louis, f.o.b.	26.00
Birmingham, f.o.b.	23.65
Lone Star, Tex., f.o.b.	19.50

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)	Price
24	84	23.00	40	100, 110	9.90
20	72	22.25	35	110	9.90
16 to 18	72	22.50	30	110	10.05
14	72	23.00	24	72 to 84	10.30
12	72	23.50	20	99	10.10
10	60	24.25	17	72	10.35
7	60	24.50	14	72	10.85
6	60	27.25	12	60	11.75
4	40	30.25	10	60	11.80
3	40	32.00	8	60	12.10
2½	30	33.75			
2	24	52.50			

* Prices shown cover carbon nipples.

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolts

	Discount Less Case	C.
½ in. & smaller x 4 in. & shorter	+5	17
½ in. & smaller x 6 in. & shorter	+12	11
9/16 in. & ⅝ in. x 6 in. & shorter	+13	10
¾ in. & larger x 6 in. & shorter	+16	7
All diam. longer than 6 in.	+25	net
Rolled thread carriage bolts ½ in. & smaller x 6 in. and shorter	+10	12
Lag, all diam. x 6 in. & shorter	+2	18
Lag, all diam. longer than 6 in.	+11	12
Plow bolts	18	18

Nuts, H.P., C.P., reg. & hvy.

	Base Discount	Discount, Case or Keg
¾" or smaller	55	64
⅞" to 1¼" inclusive	55	63
1⅜" to 1½" inclusive	57	65
1⅝" and larger	51	61

C.P. Hex. regular & hvy.

¾" or smaller	55	64
⅞" and larger	51	61

Hot Galv. Nuts (all types)

¾" or smaller	38	50
⅞" to 1½" inclusive	36	49

Finished, Semi-finished, Slotted or Castellated Nuts

¾" and smaller	55	66
⅞" and larger	51	63

Rivets

	Base per 100 lb
½ in. and larger	$9.95
	Pct Off List
7/16 in. and smaller	32

Cap Screws

	Discount Bright	H.C. Heat Treated
New std. hex head, packaged ¼" thru ⅜" diam. x 6" and shorter	34	20
9/16 and ⅝" x 6" and smaller and shorter	31	16
¾", ⅞", 1" x 6" and shorter	8	+11
New std. hex head, bulk* ¼" thru ⅜" diam. x 6" and shorter	49	41
9/16" and ⅝" diam. x 6" and shorter	48	39
¾", ⅞", 1" x 6" and shorter	31	20

*Minimum quantity per item: 15,000 pieces ¼", 5/16", ⅜" diam. 5,000 pieces 7/16", ½", 9/16", ⅝" diam. 2,000 pieces ¾", ⅞", 1" diam.

Machine Screws & Stove Bolts

	Discount Mach. Screws	Stove Bolts
Packaged, package list	27	38
Bulk, bulk list		
Quantity		
¼-in. diam. & under	25,000-200,000	20	61
5/16-in. diam. & larger	15,000-100,000	20	61
All diam. over 3 in. long	5,000-100,000	—	61

Machine Screw & Stove Bolt Nuts

	Discount Hex	Square
Packaged, package list	24	27
Bulk, bulk list		
Quantity		
⅜-in. diam. & smaller	25,000-200,000	18	20

CAST IRON WATER PIPE INDEX

Birmingham	109.3
New York	121.5
Chicago	122.9
San Francisco-L. A.	131.1

Sept. 1955 value, Class B or heavier, 6 in. or larger, bell and spigot pipe. Explanation: p. 87, Sept. 1 issue. Source: U. S. Pipe and Foundry Co.

REFRACTORIES

Fire Clay Brick *Carloads per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$122.00
No. 1 Ohio	.....
Sec. quality, Pa., Md., Ky., Mo., Ill.	114.00
No. 2 Ohio	.....
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	18.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$128.00
Childs, Hays, Pa.	133.00
Chicago District	138.00
Western Utah	.....
California	.....
Super Duty Hays, Pa., Athens, Tex., Windham	145.00
Curtner, Calif.	163.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	21.00
Silica cement, net ton, bulk, Hays, Pa.	24.00
Silica cement, net ton, bulk, Chicago District, Ensley, Ala.	22.00
Silica cement, net ton, bulk, Utah and Calif.	.....

Chrome Brick *Per net ton*

Standard chemically bonded, Balt.	$86.00
Standards chemically bonded, Curtner, Calif.	96.25
Burned, Balt.	80.00

Magnesite Brick

Standard Baltimore	$109.00
Chemically bonded, Baltimore	97.50

Grain Magnesite *St. ⅜-in. grains*

Domestic, f.o.b. Baltimore in bulk fines removed	$64.40
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	40.00
in sacks	46.00

Dead Burned Dolomite *Per net ton*

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$15.00
Midwest	15.60
Missouri Valley	14.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.l.f. New York, ocean bags	11.25¢
Canadian sponge iron, Del'd in East, carloads	9.5¢ / 10.75¢
Domestic sponge iron, 98+% Fe, carload lots	9.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	53.5¢
Hydrogen reduced iron minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 00.8+% Fe	83.0¢ to $1.48
Aluminum	31.5¢
Brass, 10 ton lots	29.50¢ to 36.50¢
Copper, electrolytic	57.75¢
Copper, reduced	57.75¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99% min., and quality, del'd	$3.60
Lead	23.50¢
Manganese	57.0¢
Molybdenum, 99%	$2.75
Nickel, unannealed	89.50¢
Nickel, annealed	96.50¢
Nickel, spherical, unannealed	93.50¢
Silicon	43.50¢
Solder powder	7.0¢ to 9.0¢ plus met. value
Stainless steel, 302	91.0¢
Stainless steel, 316	$1.10
Tin	14.04¢ plus metal value
Tungsten, 99% (65 mesh)	$4.50
Zinc, 10 ton lots	17.5¢ to 25.0¢

Ferroalloy Prices

(Effective Oct. 4, 1955)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd, 67-71% Cr, .30-1.00% max. Si.

0.02% C	38.50*	0.20% C	35.50*
0.06% C	36.50*	0.50% C	35.25*
0.10% C	36.00*	1.00% C	34.00*
0.15% C	35.75*	2.00% C	33.75*

4.00-4.50 C, 67.70% Cr, 1-2% Si . 26.25*
3.50-5.00% C, 57-64% Cr, 2.00-4.00% Si 25.00*

S. M. Ferrochrome

Contract prices, cents per pound, chromium contained, lump size, delivered.
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.
Carloads 28.65*
Ton lots 30.55*
Less ton lots 32.05*

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 3¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.
0.10% max. C $1.27*
0.50% max. C 1.27*
9 to 11% C, 88-91% Cr, 0.75% Fe.. 1.36*

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.)
Contract price, carloads, delivered, lump, 3-in. x down, per lb of Cr, packed.
Carloads 41.85*
Ton lots 46.15*
Less ton lots 48.65*

Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.
30-33% Cr, 60-65% Si, 3.00 max. Fe.
Carloads 22.95*
Ton lots 25.25*
Less ton lots 26.75*

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.
Carloads 23.05*
Ton lots 24.95*
Less ton lots 25.95*

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ⅛ in. x 12 mesh.
Ton lots 19.65
Less ton lots 20.90

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.
Carload lots 16.60
Ton lots 18.10
Less ton lots 19.35

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.
Carload packed 17.50
Ton lots to carload packed 18.25
Less ton lots 19.50

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	9.50
Clairton, Pa.	9.50
Sheridan, Pa.	9.50
Philo, Ohio	9.50

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.
Briquets, delivered, 66 pct Mn:
Carloads, bulk 12.10*
Ton lots packed 14.30*

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	32.00	33.85	35.05
0.17% max. C	29.95	31.80	33.80
0.15% max. C	28.45	30.30	31.50
0.30% max. C	26.95	28.80	30.00
0.50% max. C	26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30	26.50

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.28

Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.
Ton lots $6.90
Less ton lots 6.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb con't Cb plus Ta. $4.65

Other ferroalloy prices appeared in the Sept. 29 issue, will again appear Oct. 13

extra!

ALL ABOUT THE LATEST BENDING METHODS

Let Pedrick show you how the latest methods of bending pipe, tube and structural metal—on a job or production basis—can save you money.

For full information on Pedrick Production Benders, write PEDRICK TOOL AND MACHINE CO., 3640 N. Lawrence St., Phila. 40, Pa. Dept. 2.

FREE "PEDRICK LINE" BULLETIN. WRITE TODAY. SEE BOOTH 741 NATIONAL METAL SHOW, PHILADELPHIA, OCT. 17-21

PEDRICK production benders

RAILWAY EQUIPMENT

FOR SALE

Used - As Is - Reconditioned

RAILWAY CARS

All Types

"SERVICE-TESTED"

FREIGHT CAR REPAIR PARTS

For All Types of Cars

LOCOMOTIVES

Diesel, Steam, Gasoline, Diesel-Electric

1—80-Ton, 0-6-0

LIMA STEAM SWITCHING LOCOMOTIVE

Excellent I.C.C. Condition

RAILWAY TANK CARS and STORAGE TANKS

6,000-, 8,000- and 10,000-Gallon Cleaned and Tested

CRANES

Overhead and Locomotive

RAILS

New or Relaying

IRON & STEEL PRODUCTS, Inc.

General Office
13496 S. Brainard Ave.
Chicago 33, Illinois
Phone: Mitchell 6-1212

New York Office
50-b Church Street
New York 7, N. Y.
Phone: BEekman 3-8230

"ANYTHING containing IRON or STEEL"

THE CLEARING HOUSE

News of Used and Rebuilt Machinery

Sales Cheer Chicago . . . "This summer was one of the best in years," say most new and used machine tool distributors in the Chicago area.

Little slough-off in customer demand for such items as forging machines, structural machinery, and bolt and nut fabricating equipment was noted by distributors during the normally "easier" summer months of July and August.

In the expectation that business volume will continue at the current good pace, some used equipment dealers are enlarging their reconditioning and rebuilding facilities some 10 to 20 pct.

See Big Gain . . . Generally speaking, feeling among both new and used machinery distributors is that the volume of orders is up at least 20 to 40 pct over the same period a year ago. Partly responsible for the upswing in the number of customer inquiries and actual sales, it's conceded, was the interest stirred by the Machine Tool Show and some of the local displays put on by distributors.

A second factor currently reflected in the stronger business volume is that customers who had held off in their normal buying patterns, especially with respect to new machinery during last year, can no longer afford to wait to make new purchases. As viewed at the distributor level, current sales trends in both new and reconditioned equipment are approaching the generally good levels of 1953.

Broad Interest . . . Sheet metal equipment, light stamping equipment, electrical equipment, boring mills, planing machines, lathes, milling machines have been sharing in the selling advance, along with heavy presses.

The inquiry and actual sales rates for new machine tools have been mounting steadily, with orders coming in from all parts of the country in addition to those from Europe and some points in Asia, South America, and even Australia.

One large area distributor currently has plans afoot for sending its export manager to Europe for two months to handle expected increased order volumes for both used and some new equipment. Sales volume, this source reports, is especially good in the heavy press line.

Stage Comeback . . . Surface grinders and planers, which had a rather up and down demand period at the start of this year, have made a strong comeback. Feeling is they'll continue to show a firm sales level for the rest of the fourth quarter.

Heavy purchases of electrical equipment suggest that the current buying trend will continue into the normal December-January slow-down.

Sheet metal tools, according to one source, have approximately tripled in sales this year over last with strong demand expected to hold for the balance of the year.

Product Demand Helps . . . One important factor underlying customers' heavier purchases of new and used machinery is that the strong demand level for their own products has encouraged many purchasers to plan somewhat higher machine tool outlays for the balance of this year than had been previously estimated by even the most optimistic distributors.

Heavier buying and steady volume in light equipment sales is regarded generally as further proof that the current strong sales outlook is good on a "long term" basis.

Interestingly, one distributor noted that bulk of his sales—especially to the smaller machine shops—still runs better than 75 pct in standard lines.

THE SHOW HAS MOVED TO EMERMAN'S

EXCERPTS FROM OUR STOCK

FOR *SALE* OR *RENT*

4'9" Cinn.-Bickford Super Service Radial Drill, Ser. #IR2735, New 1944

4" Sellers Horizontal Table Type Boring Mill, Serial No. 04-1317, New 1942. Over Size Machine. Type A Barber Colman Gear Hobber, Extended bed, Power Down Feed, Serial No. 1363, New 1942

6'17" American Hole Wiz. Radial Drill, Ser. #64854, New 1945

26" x 72" Monarch Series 60 Engine Lathe Ser. #37063, New 1953

24" x 78" Monarch Air Tracer. Ser. #36842, New 1953

28" x 120" Monarch Air Tracer, Ser. #37062, New 1953

25"-50" x 14'17" LeBlond Gap Lathe W/Tracer Control. New 1953

42" Bullard V.T.L. Spiral Drive Ser. #20666. New 1943

#18 Blanchard Ser. #5014 30" Chuck. New 1944

40-Ton LaPointe, Model SRV, Vert. Surface Broach, 66" Stroke, Ser. #43141, New 1943

8" Barber Colman, Type V, Vert. Gear Hobber, Ser. #99, New 1946

#24 Gleason Straight Bevel Gear Generator, 35½" Dia., Ser #17916, New 1942

20" x 72" Cinn. Plain Cyl. Grinder, Filmatic Bearings, 84" Centers, Ser. #7B6FIY-2, New 1952

24½" x 28' Monarch Engine Lathe, 2 Carriages, 2 Taper Attachs., Rap. Trav., Ser. #6806, New 1940

#4 Cinn. Dial Type Univ. Mill, Ser. #4A4U1H-3, New 1940

78" Betts Heavy Duty Boring Mill, Complete Electrics. New in 1942

36" Rockford Hydraulic Vert. Slotter, Ser. #47-S1-85, New 1946

#4 Cinn. Hi-Speed Dial Type Vertical Mill, Ser. #8A4V1K-35, New 1941

#4 Cinn. Hi-Speed Dial Type Plain Mill, Ser. #4A4P1L-132, New 1943

EMERMAN MACHINERY CORP.

865 WEST 120th STREET **Telephone: PUllman 5-7626** **CHICAGO 43, ILLINOIS**

THE CLEARING HOUSE

CONSIDER GOOD USED EQUIPMENT FIRST

ANGLE BENDING ROLL
No. 2 Buffalo Angle Bending Roll
BALER
#125-TC Galland Henning, Volume of Box 145 cu. ft., Bale Size 500 to 800 lbs.
BENDING ROLLS
8' x 3/16" Bertsch Initial Type
12' x ¼" Hilles & Jones Pyramid Type
16' x ⅜" Bertsch Initial Type Bending Roll
18' x ⅝" Wickes Pyramid Type
20' x 1" Hilles & Jones Pyramid Type Bending Roll
BRAKES—LEAF TYPE
8' x ¼" Dreis & Krump Size 186
12 x ½" Dreis & Krump, Motor Driven
BRAKES—PRESS TYPE
12' All Steel Press Brake, 250 ton Capacity
10' x 3/16" Cincinnati No. 70
CAR PULLER
Clyde Iron Drum Electric Car Puller, Capacity 43,750# Max. Starting Pull
CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton P&H Trav-Lift	20' Span	220/440 A.C.
5 ton Northern	57' Span	220/3/60 A.C.
5 ton Cleveland	90' Span	230 Volt D.C.
10 ton Niles	52' Span	220 Volt D.C.
10 ton Shaw	72' Span	230 Volt D.C.
10 ton Northern	75' Span	230 Volt D.C.
10 ton P&H	96' Span	220 Volt D.C.
15 ton P&H	56' Span	230 Volt D.C.
15 ton P&H	70' Span	230 Volt D.C.
20 ton P&H	60' Span	220 Volt D.C.
20 ton P&H	60' Span	230 Volt D.C.
20 ton Toledo	75' Span	550/3/60 A.C.
30 ton Shaw	60' Span	230 Volt D.C.

DIEING MACHINE
25 ton Henry & Wright, 1½" Stroke, Double Roll Feed, Scrap Shear
DRAW BENCHES
50,000# Standard Double Draw, 48' Length of Draw
100,000# Standard Double Draw, 25' Length of Draw
FORGING MACHINES
1" to 5" Acme, Ajax, National
4", 5", 7½" National High Duty, Air Clutch
FURNACES
Ther-Monic Induction Heater Model 1400
15 ton Herault Top Charge, With Transformer
HAMMERS—BOARD DROP—STEAM DROP STEAM FORGING—800 lb. to 20,000 lb.
LEVELERS—ROLLER
52" McKay 17 Rolls 2⅜" Dia.
60" Aetna Standard 17 Rolls 4½" Dia.
72" McKay 15 Rolls 4½" Dia.
PRESSES—HYDRAULIC
250 ton RD Wood Hydr. Joggling Press
500 ton HPM Fastraverse Press, 24" Stroke Pressing Area 26"x36", Max. Daylite 42"
1200 ton Birdsboro 4-Column, 36" Stroke Dist. Bet. Columns 30" x 36", Daylite 42"
1257 ton Baldwin Southwark Forging Press, 30" Stroke Main Ram, 54" x 41" Bet. Columns
2045 ton Birdsboro, 4-Columns, 14" Stroke Platen 42" x 60", Daylite 47"
4500 ton B-L-H Hydr. Forging Press
PUNCH & SHEAR COMBINATIONS
Style EF Cleveland, 36" Throat, Punch 1¼" thru 1" Style W Cleveland Single End, 60" Throat, 312 Ton
ROLL—PLATE STRAIGHTENING
84" Hilles & Jones, Six Rolls 10" Dia., M.D.
ROLLING MILLS
12" x 20" Garrison & W-F Two Stand Two High
12" x 20" Garrison Single Stand Two High
12" x 24" Garrison Single Stand Two High
16" x 20" Waterbury Farrel Single Stand 2-High
16" x 24" Farrel F&M Two Stand Two High
20" x 26" Hoagland Single Stand Two High
24" x 44" Garrison Two High Hot Mill
SHEARS—GATE
46" x 1/4" Mackintosh-Hemphill
80" x ⅝" Pels
SHEARS—ANGLE
6x6x1" Long & Allstatter Size B
8x8x1" Long & Allstatter Size C
SHEAR—BAR
#9 Buffalo Bar Cutter, Capacity 3" Sq., 3⅝" Rd.
#4 H&J Guillotine Type Bar Shear Capacity 3½" Square, 4" Round
SHEARS—ROTARY
3/16" Quickwork Rotary Shear, 36" Throat
¼" Kling #250, With Flanging Attachment
½" Quickwork Whiting #04A—NEW 1953
⅝" Kling #750, 48" Throat, Circle Cutting Attach.
1" Kling No. 100, 48" Throat, Joggling Rolls Incl.
SHEARS—SQUARING
10' x 12 Ga. Niagara No. 510B
7' x ⅜" Long & Allstatter Model W-53
12' x ¼" Bertsch Model JL-12
10' x ½" Niagara Model L-10-½
SLITTERS
36" Yoder Slitting Line with Coilers
38" Paxson Coil & Sheet Slitter
38" Custom Built Slitting Line, with Coilers & Leveler
STRAIGHTENERS
Kane & Roach 5-Roll, Capacity ⅝" to 1½" dia.
Taylor Wilson Cross Roll, Capy. ⅝" to 1½" Bars
Sutton 5-Roll, Capacity 4½" to 12¾" Pipe
⅝" Haliden #3, With 20 ft. Cut-Off
TESTING MACHINE
5,000, 10,000, 100,000, 200,000# Olsen & Riehle Universal; 50,000 & 200,000# Compression
THREAD ROLLER
Model A32 Reed Thread Roller, Horizontal, Capacity Approx. Work Dia In-feed, Standard Equip. 1" to 4"
UNCOILER
#60-36 Littell Uncoiler, Motor Driven, Coil Capacity 6000 lbs., Max. Coil Width 36"
WELDER
200 KVA Progressive Univ. Seam Welder, 220 v, 60 cy.
WIRE DRAWING MACHINE
14 Die Synero BCS, With Spooler & Blocker Capacity Start .105", Finish .0101"

• Manufacturing

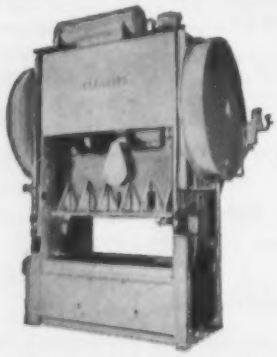
A. T. HENRY & COMPANY, INC.
50 CHURCH ST., NEW YORK CITY 8
Telephone COrtlandt 7-3437

Equipment •

Confidential Certified Appraisals
Liquidations — Bona Fide Auction Sales Arranged

Consulting Engineering Service
Surplus Mfg. Equipment Inventories Purchased

WORLD'S LARGEST STOCK
STAMPING PRESSES
BLISS • CLEARING • CLEVELAND
FERRACUTE • HAMILTON • L & J
NIAGARA • TOLEDO • V & O



SQUARING SHEARS • PRESS BRAKES
REBUILT and GUARANTEED

JOSEPH HYMAN & SONS
TIOGA, LIVINGSTON & ALMOND STS.
PHILADELPHIA 34, PA. Phone GArfield 3-8700

SELECT MACHINE TOOLS

GRINDING MACHINES
No. 2 Cincinnati centerless, flmatic.
40" No. 16A2 Blanchard 2-spd. rotary, new 1948.
72" Colonial broach grinder, Late
72" Hanchett 3-spd. rotary surface, new 1946.
12" x 48" Norton universal cylindrical, late.
16" x 96" Landis gap type cylindrical, new 1941.
13" x 60" Model 500 Hanchett vert. spdl., late.
10" x 24" Cincinnati hyd. universal cyl., flmatic.

HAMMERS
No. 6-1 Nazel, pneumatic, late
No. 5N Nazel, self-contained.
No. 6B Nazel, self-contained.

LATHES
No. 5 Jones & Lamson ram type univ. turret
14" x 6' Hendey Toolroom, 1940.
15" x 30" Lipe Carbo-Matic, 1942.
9" x 18" Hendey Prec. Tool & Gauge, 1940.

MILLS
1-18 Cincinnati production.
Model 2-20 Kent-Owens hyd. mill.
1-2-3-4-5-6 knee type plain & vertical.
60" x 48" x 10' Ingersoll adj., rail planer type.
No. 2H K & T plain horiz., new 1942.

PLANERS
36" x 66" Rockford Hyd. Openside Shaper-Planers.
48" x 48" x 10' Gray Maxi-Service.

PRESSES
113 ton No. 78 Toledo gap frame, S.S.
260 ton No. 795½-72 Toledo D.C. Toggle drawing.
350 ton 90" No. 4000 Bliss D.C. Toggle drawing.
500 ton No. 1039 Hamilton D.C., adj. bed, 60"x102".
545 ton No. H3612½ Hamilton Forging Press.
1000 ton No. 606 Toledo coining or forging.

SHAPERS
20" Rockford "Hy-Draulic" universal
32" G & E Invincible, F.M.D., late type.

UPSETTERS
2" National Upsetter
3½" Ajax, suspended slides, steel frame.
5" Ajax, suspended slides, steel frame.

1000 Tools in Stock

Free Illustrated Catalog

MILES MACHINERY CO.
Phone Saginaw 2-3105
2041 E. Genesee Ave. Saginaw, Mich.

2—#56 Buffalo Mill Type Open Throat Bar Shears, 6" Stroke, Capacity 275 Ton.
Kling No. 6 Bar & Billet Shear 6" round.
Hilles and Jones and Buffalo Bar Shears 1½", 2", 2½", 3", 3¼", 4" and 4¼".
Plate Shear, "C", Long and Allstatter 15'x½".
Plate Shear Long and Allstatter capacity 6' x 1".
2-A Williams White hydraulic tube bender, capacity 2".
700 and 1000-ton Ajax High Speed Forging Presses air clutch.
4000 Lb. Niles Bement Double Frame Steam Forging Hammer.
1500 Lb., 3300 Lb. Chambersburg Single Leg Steam Forging Hammers.
Chambersburg Model J, motor drive, board drop hammer, 1000 lb.
Nazel Air Forging Hammers, #4-B, #5-N.
Williams White Bulldozers, #22, #3, #4, #25, #6, #29 U type.
Ajax Forging Rolls, from #1 to #4.
1½" Ajax Upsetting and Forging Machine, air clutch.
Ajax & National Upsetters, Suspended Slides, 1", 1½", 2", 3", 4".
Upsetting and Forging Machine. Not Suspended Slides, ¾", 1", 1½", 2", 2½", 3".
300-Ton Oilgear High Speed Hydraulic Press, 2-Column, ram 27" x 27".
600-Ton Verson Knuckle Joint Coining Press.
Landis Landmaco Threading machines with lead screws four spindle 1½", two spindle ⅞", two spindle 1", two spindle 1½".
Multiple Punch, Size G, L & A, 940 Ton.
Single and Double End Punches, various capacities and throat depths.

BOLT, NUT AND RIVET MACHINERY, COLD HEADERS, THREAD ROLLERS, THREADING MACHINES, TAPPERS, COLD BOLT TRIMMERS, SLOTTERS, HOT HEADERS AND TRIMMERS, COLD AND HOT PUNCH NUT MACHINES.

DONAHUE STEEL PRODUCTS CO.
1913 W. 74th Street, Chicago 36, Ill.

PRESSES

#165 TOLEDO, Toggle, Tie Rod, Double Back Geared, 125-ton, 14"—10" stroke, M.D.

#645-B BLISS, S.S.D.C., Hi-Speed, Flywheel, 3" stroke, double roll feed, Reeves vari-drive, scrap cutter.

#650 BLISS, S. S. S. C., Hi-Speed, Flywheel, 2" stroke, roll feed, scrap cutter, automatic oiling.

POWER PRESS SPECIALISTS
471 North 5th St. Phila. 23, Pa.

Nos. 2 & 4 B & S Automatics, M.D.
Deckel No. S1 Univ. Grinder, 1952.
No. 3 Plan-O-Mill, M.D., Late.
No. 3A B & S Univ. Mill, M.D.

D. E. DONY MACHINERY CO.
4357 St. Paul Blvd. Rochester 17, N. Y.

22" x 336" centers MONARCH model M Heavy Duty Lathe—two carriages, M.D.
No. 5 CINCINNATI High Power Plain Miller with motorized overarm.
No. 1L GISHOLT Universal Turret Lathe—new 1946

WIGGLESWORTH INDUSTRIAL CORP.
62 Border St., East Boston 28, Mass.

With 500 ft. frontage on a main transport artery, and with complete port and rail facilities nearby, this substantial plant offers unlimited opportunities for U.S. manufacturer desiring to establish in Canada.

Located in the heart of Ontario's rich market . . . close to metropolitan areas where over 40% of Canada's retail sales are made.

Included in the parcel:

— One, 6256 sq. ft., 2-storey, brick building including 4000 lb. capacity freight elevator.

— One, 11,480 sq. ft., single-storey brick building containing 7½-ton and 5-ton Overhead Cranes; and a 7400 sq. ft. adjoining building with floor-operated, standard overhead crane and indoor railway siding.

— One, 14,896 sq. ft. single storey brick building with 7½ ton overhead crane and outdoor rail siding.

— One, 2534 sq. ft. Brick Veneer and frame office building heated by oil-fired hot water system. Also 907 sq. ft. building suitable for time office, etc.

— One, 2684 sq. ft. frame garage.

— One, 1377 sq. ft. building for factory washrooms, etc.; and a 2013 sq. ft. wooden lean-to.

— 680 sq. ft. Boiler Room fully equipped; and Generating Room with complete motor generator set.

All services, including electricity, water, railway, caretaking, etc., ready for use. Price - $2,000,000.00.

For full particulars, write to Mr. D. A. Lindsey

READY FOR OCCUPANCY. Plant has been cleared, and purchaser may have immediate possession. Picture shows part of interior of large, single-storey steel truss brick building with 7½ ton overhead crane.

MODERN BRICK OFFICE faces main industrial paved thoroughfare. Centrally located, but with easy, fast access to all highways, port facilities, and neighbouring industry.

DOMINION FOUNDRIES AND STEEL LIMITED, Hamilton, Ontario, Canada

THE CLEARING HOUSE

CALL Curry! FOR SURPLUS STEEL PLANT EQUIPMENT

1—Bar and Rod Mill—Cross Country, 2 stands 18" x 60" 3-Hi Rougher, 3 stands 12" x 32" 3-Hi Intermediate, 6 stands 10" x 24" 3-Hi Finishing and 1 stand 10" x 24" 2-Hi Finishing. Complete with Shears, Guides, etc., and all Electric Drives.

1—15" Wide Continuous Hot Strip Mill, 8 stands continuous, 4 stands cross country, complete with Furnace, all Electrics, Main Drive Motor, Hot Bed and Shears.

Write for the Curry List of available steel plant equipment

1—20"/24" Wide Continuous Strip and Plate Mill. Motor Driven throughout, including all Electrical Equipment and Furnaces. For rolling slabs 20"/24" x 3" x 10' down to plate or strip from 1" to .065" finished gauge. Annual capacity 150,000 tons.

ALBERT Curry & CO. INC.
STEEL PLANT EQUIPMENT
941 OLIVER BUILDING · PITTSBURGH 22, PENNA.
Phone ATlantic 1-1370

1—25" & 42" x 66" 4-Hi Reversing Hot Strip Mill, including Housings, Pinion Stand, Gear Reducer, Chocks, Bed Plate and Motor Driven Screwdown.

1—2000 HP GE Slip Ring Motor, 237 RPM, 3 phase, 60 cycle, 2300 Volts, complete with all controls and Forced Air Cooling System.

1—144" x 3/16" Stamco Power Squaring Shear, Spring Activated Holddown and Spring Top Knife Balance. Rebuilt and Guaranteed.

2—2000 HP Mesta Gear Reducers, Ratios 10 to 1 and 7.375 to 1.

Cable Address: CURMILL-PITTSBURGH

eastern Rebuilt Machine Tools

THE SIGN OF QUALITY—THE MARK OF DEPENDABILITY

AUTOMATICS
9/16" Cleveland, m.d.
⅞" Cleveland Model B, belt
No. 6C Potter & Johnston, m.d.
14" Fay Flanders Type, m.d.
No. 8A Cleveland, m.d., 8" cap., latest
Model B—1 1/16" Cleveland, m.d.
Model A—1⅜" Cleveland Single Spindle, late
4 spindle 1⅜" Cleveland Model M, m.d.
No. 5 DELX Potter & Johnston, m.d., late
No. 6 DRELX Potter & Johnston, m.d., later type
2½" Cleveland, m.d., Model A
2" Cleveland Model A, single spindle, m.d.

BOLT THREADERS
Victor Nut Facing Machine, m.d., cap. ⅜" to 2" Nuts
1" Landis Double Spindle, m.d. thru gear box
1½" Landis 2 spindle, late
1½" Landis 2 spindle, older type
1½" Landis Stay Bolt Threading Machine, Double Head, m.d.
No. 326 Oster Bolt & Pipe Threading Machine, m.d.

HORIZONTAL BORING MILLS
#7 Barrett Horizontal Boring Machine
3" Universal Horizontal Boring Mill, m.d.
No. 25T Giddings & Lewis, m.d., late
No. 32 Lucas, m.d.
Barrett Double End, 7" and 5" spindles, m.d.
5" bar Ohio Table Type, m.d.
5½" bar Betts Floor Type, m.d.
5½" bar Niles-Bement-Pond, m.d.
6" bar Newton No. 2 Cylinder Borer, m.d.
10" bar Sellers Floor Type, m.d.
Natco Horiz. Drill, with 2 spindles on one end, m.d., late
Floor Plates—all sizes

We carry an average stock of 2,000 machines in our 11 acre plant at Cincinnati. Visitors welcome at all times.

THE EASTERN MACHINERY COMPANY
1002 Tennessee Avenue, Cincinnati 29, Ohio
MElrose 1241 **CABLE ADDRESS—EMCO**

1—12" x 16" Waterbury Farrel temper mill, complete with drive, take-up reel & pay-off reel; all electrical.

1—3 stand U. E. & F. Co. 10" x 14" cold mill, drives for each stand, take-up & pay-off reels, spindles, chucks and furniture.

1—Crane runway, 80' crane rail span, 370' long, 52' floor to crane rail, building type with flat trusses—runway cap. 150 tons.

1—12 ton Gantry Crane, Shepard Niles, 228 1¼" span, 15' lift, cab operated—built in 1948.

Lou F. Kinderman
Box 182 - Niles, Ohio · Phone OL 2-9876

IMMEDIATE DELIVERY

BLISS #96 ¾—72 Double Crank Press 600 Ton Cap., Bed 72" x 55"
BLISS-TOLEDO #95C Double Crank Press 250 Ton Cap., Bed 60" x 40"
Both have Air Clutch, Air Cushion, Air Counter Balance & are Still Set Up in Operation
CLEARING #K-1200-30 Knuckle Joint 200 Ton Cap., 4" Stroke Air Clutch
TOLEDO #663A Knuckle Joint 400 Ton Cap., 9½" Stroke Air Clutch

"If it's machinery we have it."

NATIONAL MACHINERY EXCHANGE
128 Mott St. New York 13, N. Y.
CAnal 6-2470

COMPRESSOR DIRECTORY
World's Best Rebuilts

A few from our stock of many—
20.6 CFM 250 PSI Curtis (3) stage
95 CFM 100 PSI 7 x 6-1R-CPT-Penn
155 CFM 3000 PSI 12¾ x 10 (4) stage Norwalk
136 CFM 125 PSI 8 x 8-1R-CPT-Penn
158 CFM 240-350 PSI 5¾ x 10 Ing. XRE 3-60-2300
168 CFM 100 PSI 8½ x 9 Worth.
173 CFM 100 PSI 9 x 8 1R-CPT-Amer.
268 CFM 200 PSI 10-4½ x 10 Ing. XDB
500 CFM 4000 PSI (4) stage Cooper Bessemer 3-60-2300
470 CFM 100 PSI 13-9 x 10 Ing. XRB
1000 CFM 100 PSI 16-9½ x 10 Sullivan WN4 3-60-2200
1574 CFM 100 PSI 22-14 x 10 Ing. PRE2 3-60-2300
1800 CFM 100 PSI 23-13 x 16 CPT OCE 3-60-2300
2200 CFM 100 PSI 26-15 x 16 CPT OCE 3-60-440

AMERICAN AIR COMPRESSOR CORP.
DELL & 48TH STREET
NORTH BERGEN, N. J.
Telephone UNion 5-4848

3¾" Late Type Defiance Horizontal Table Type Boring Machine Serial #921-39
#24 Tri-Way 3" Universal Boring Mill Serial T2430
2 3-4 Spindle Leland Gifford Drills
#300 Hanchett Vertical Surface Grinder Serial #300-17
DB 2112-A Excello Single End Baromatic Ser. #10160
#47 Heald Single End Baromatic Serial #4646
(2) Greenfield #28 Hydraulic Internal Grinders Serials #1-11-11902 and F4-11235
7A Jones & Lamson Turret Lathe Serial #60459
#72A 3 Heald Sizematic Internal Grinders Serial #12276
Late Type 12" x 48" Landis Type C Universal Hydraulic Cylindrical Grinder Ser. #17898
(2) 24' x 8' x 10" Thick T slotted Floor Plates
(2) 20' x 6' x 14" Thick Layout Plates. Plain no T slots.

HAZARD BROWNELL MACHINE TOOLS, INC.
350 Waterman St. Providence 6, R. I.
Dexter 1-8880

EST. 1904
DAVIDSON PIPE COMPANY INC.
ONE OF THE LARGEST STOCKS IN THE EAST
Seamless and Welded ⅛" to 26" O.D.
All wall thickness Manufactured.
Specialty large sizes.
Cutting — Threading — Flanging — Fittings — Valves.
Call GEdney 9-6300
51st St. & 2nd Ave., N. New York 22, N. Y.

6' arm 19" col. CARLTON RADIAL DRILL
48 Spindle Speeds 10 to 1000 RPM.
20 HP. A.C. Motor Drive. New in 1943.
Inspection under power.

FALK MACHINERY COMPANY
18 Ward St. Baker 5887 Rochester 5, N. Y.

IMMEDIATE SHIPMENT

2—500 KW General Electric Synchronous Motor Generator Sets

Generators: type MPC, 240 Volts D.C. 900 RPM, 40 degree

Synchronous Motors: 725 HP, 830 KVA, 3 PH 60 Cycle 2200 Volts. Equipment: D.C. Panels and C R 7069Y1

Synchrouous Motor Panels

LAND

EST. 1910

ELECTRICAL EQUIPMENT

A.C. & D.C.
MOTORS AND GENERATORS
One of America's Largest Stocks
RELIABLY REBUILT
IN OUR OWN SHOP
1 YEAR GUARANTEE
Send us your Inquiries

L. J. LAND INC.

150 GRAND ST., NEW YORK 13, N. Y.
Phone: CAnal 6-6976

FOR RENT or LEASE

CARBURIZING FURNACE BARGAINS!

New Ipsen Carbonitriding Furnace
Model TC 300 E. Also rebuilt T250.
L & N Homocarb, 24" dia. 36" deep.
S. C. pusher, radiant tube, 34"W., 25'L., 15"H.
S. C. Shaker Hearth, 24"W., 100"L., 7"H.
Please call collect or drop a card for our complete list of heat treating, melting and metal finishing machines.

METAL TREATING EQUIPMENT EXCHANGE

9825 Greeley, Detroit 11, Michigan
TOwnsend 8-8450 — Please call "collect"

Overhead Cranes & Hoists

NEW & USED

10-ton Case Crane, 56' 11" span, 3-motor, 220/3/60, floor controlled, pendant type, box girders, excellent condition—inspection under power—sacrifice price for immediate sale before storing same.

Available 100 cranes various spans, tonnages and current.

JAMES P. ARMEL — Crane Specialist

710 House Bldg. Pittsburgh, Pa.
Tele: Gr. 1-4449

FOR SALE OR RENT

1—35 ton, 4-wheel Diesel Electric Locomotive.
1—50 ton 0-4-4-0 Diesel Electric Locomotive.
1—25 ton Ind. Brownhoist Diesel Locomotive Crane.
1—10 ton Krane Kar.
1—Large Lot New Spare Parts for 25-ton Industrial Brownhoist Loco. Crane.
2—20 and 25 Ton Truck Cranes.
1—Burro Model 30 Rail Crane.

B. M. WEISS COMPANY

2206 Girard Trust Building Philadelphia, Pa.

FOR SALE

Freight car repair parts
Relaying rails
Steel storage tanks
Freight cars and Locomotives

ALSO

2—42" Bullard Spiral Drive Vertical Turret Lathes—1944
1—42" Bullard Vertical Turret Lathe, New Era
Contracting Equipment
Cranes — Tractors
Ditchers — Compressors
Diesel Engines
and Generating Sets

THE PURDY COMPANY

8754 S. Dobson Ave.
Chicago 19, Illinois

St. Louis, Mo. So. San Francisco, Calif
Los Angeles, Calif.

D.C. MOTORS

*230 Volt

HP	MAKE	TYPE	SPD.
250	Westg.	SK-220	450/600
200	Westg.	SK-201	650
200	Cr. Wh.	CM	500
175	G.E.	EIC	750
100	G.E.	MPC	400/800
100	G.E.	RC-34	2500
100	G.E.	RC-18	575
75/75	Westg.	SK-151	400/1600
50/120	G.E.	MCP	250/1000
50	Cr. Wh.	CMC	700/1100
50	G.E.	DLC	650
30	Cr. Wh.	CCM-50H	450
30/40	G.E.	CD-115	500/1500

CHICAGO ELECTRIC CO.

1335 W. Cermak Rd., Chicago 8, Ill.

7½" BAR
INGERSOLL HORIZONTAL BORING, DRILLING & MILLING MACHINE

Table 60" x 120"
Motor & Controls
Rebuilt

LANG MACHINERY COMPANY

28th St. & A.V.R.R. Pittsburgh 22, Pa.

BENNETT MACHINERY CO.

1—84" KING VERT. BOR. MILL

New 1943—3 Hds.; 88" swing, 60" ram travel; 70" under rail, wt. 98000 lbs. (Send for list of 200 stock tools)

375 Allwood Rd., Clifton, New Jersey
Phone: PAssaic 9-8996 — N. Y. Phone: LOngacre 3-1329

RE-NU-BILT GUARANTEED ELECTRIC POWER EQUIPMENT

D. C. MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	3000	Whse.	Tandem	550	600
1	2200	G.E.	MCP	600	400/500
3	1500	Whse.	Rev.	600	600
1	1400	G.E.	MCP	600	63/190
1	1200	G.E.	MCP	600	750/850
1	1000	G.E.	MCP	600	350/700
1	940	Whse.	QM	250	140/170
1	800	Whse.		250	450/550
1	600	Al. Ch.		250	400/800
1	500	Whse.	CC-216	600	300/900
1	500	G.E.	MCP	250	300/900
3	450	Whse.		550	415
1	350	Whse.		250	350/900
1	250	G.E.	MPC	230	400/600
1	200	Rel.	1970T	230	720
1	200	G.E.	CD-1650E	230	800/1500
1	200	Whse.	CB-5113	230	400/800
1	150	G.E.		600	250/750
1	150	Cr. Wh	85H	230	1150
6	150	Cr. Wh.	83H-TEFC	230	890
1	150	Whse.	SK-151B	230	900/1800
1	150	Whse.	SK-201	230	360/950
1	120	G.E.	MCP	230	250/1000
1	125	Whse.	SK-141	230	500/1500
1	125	Whse.	SK-182	230	850

M-G Sets—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	D.C. Volts	A.C. Volts
2	2000/2400	G.E.	450	250/300	2300/4600
1	1750/2100	G.E.	514	250/300	2300/4600
1	2000	G.E.	500 25cy	600	11000
1	2000	G.E.	514	600	6600/13200
1	1500	G.E.	720	600	6600/13200
1	1500	C W	514	30/115	4000/13000
1	1000	G.E.	720	600	2300/4600
2	750	G.E.	720	275	2300/4600
1	750	C W	514	30/115	2300
1	750	Whse.	900	250	2300/4000
1	600	G E	720	250	440/2300
1	500	Whse.	900	250	2300/4000
1	300	Whse.	1200	250	208/440/550

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
2	4200	G.E.	FOWT	3	12500x115/200
1	3000	Wagner	HPW-30	3	26400x2400
2	1000	G.E.	HVDDJ	1	2400x480
6	1000	Wagner	OISC	1	13200x460
8	667	G.E.	HD	1	13800x2300

BELYEA COMPANY, INC.

47 Howell Street, Jersey City 6, N. J.

REBUILT—GUARANTEED ELECTRICAL EQUIPMENT

SPECIALS FOR STEEL MILLS
Motor Generator Sets

Qu.	KW	Make	R.P.M.	D.C. Volts	A.C. Volts
1	2000	Whse.	720	600	4160/2300
2	1250	Whse.	720	600	2300
2	1000	Whse.	514	600	11,000/6900
1	750	Whse.	900	250	4000/2300
1	500	Cr. Wh.	720	600	2300/440
2	500	Whse.	1200	125/250	2300/440
1	400	Cr. Wh.	1200	125/250	2300/440
1	300	G.E.	1200	250	2200
1	200	G.E.	1200	250	2200
1	150	G.E.	1200	250	2300
1	100	Whse.	900	250	2300

LARGE MILL MOTORS

Qu.	H.P.	Make	R.P.M.	Volts	Type
2	3000	Whse.	600	525	tandem
6	1500	Whse.	600	525	Rmtl.
1	1250	G.E.	850/700	600	MCP-6
4	800	Whse.	600	525	Rmtl.
4	700	Whse.	800/700	250	Rmtl.
2	600	Al. Ch.	500/600	600	Mill
1	250	Al. Ch.	350/1000	250/375	Mill

MILL AND CRANE MOTORS WESTINGHOUSE

(25)—K-1-2-3-4-5-6-7-8-9.
(74)—MC-20-30-40-50-60-70-80-90-100
(18 of these are type MCB)
(6)—MC-21-31-41

GENERAL ELECTRIC

(46)—CO-1803-5-6-7-8-9-10-11
(16)—CO-1822-24-25-26-28-29-30
(19)—MD-101-2-3-4-4½-6-8-9
(6 of these are type MDB)
(32)—MD-MD8-MDP-403-4-6-8-10-12-14-20

CROCKER-WHEELER

(27)—8W-7½-10-15-AW-A2W-BW-DW-FW
We also have a large stock of Electric Brakes, Drum type and Magnetic Control Panels.

TYPICAL PACKAGE MILL DRIVE

(2)—600-HP., Al. Chal. 600-V. motors 300/600-RPM.
(1)1200—K.W. Whse. 2-unit M.G. Set. Gen. 600-V., 720-RPM. with 1700-HP. Syn. motor, 5-P.F., 2300-V. and Mag. Red. Voltage starting.
Or—(1)—3-unit, 1200-K.W., M.G. Set for variable voltage application.

T. B. MAC CABE COMPANY

4302 Clarissa St., Philadelphia 40, Penna.

Cable Address: "Macsteel" Philadelphia, Pa.
Phone: Davenport 4-8300

THE CLEARING HOUSE

A Voluntary Partial Liquidation by the Discontinuance of Fabricating & Equipment Div.'s of Kulka Industrial Corporation, Alliance, O., by

PUBLIC AUCTION

500 TONS STEEL EQUIPMENT

36 x ¼ Sq. Shears, 72 x 1 Sq. Shears, Ironworkers, Punches, 48" Rad. drill, hydraulic saw, bending roll, cranes, hoists, 15 ton—96' span show crane and runway, Welders, surface grinder, lift trucks, wench truck, compressor, receivers, millers, threaders, tool grinders, spot welders, abrasive cut-off saw, shop trucks, shop welders, grinders, drills, etc.

Wide assortment of structurals and plates, standard beams, Jr. beams, Light beams, Wide Flange beams, Channel, Reinforcing Rods, Plates, Angles 1 x 1 to 8 x 8, H.R. Hex and squares, H.R. Sheets, H.R. Rounds, Flats and wide range of plate sizes. This steel offered in suitable size lots of related sizes.

SALES DATE TUES. OCT. 18—INSPECTION OCT. 10-14

Ask For Brochure

HETZ AUCTION SALES, INC., P. O. BOX 671, WARREN, OHIO

Ph. Niles OL 2-6688 Auctioneers-Appraisers-Liquidators

FURNACES FOR SALE

COMPLETE—LIKE NEW

IMMEDIATE DELIVERY

G. E. ROLLER HEARTH 850 KW 1850 deg. F, 5' wide, 18" high, 33' long & 80' cooling.
G. E. ROLLER HEARTH gas fired, radiant tube, 5' wide, 18" high, 33' long & 80' cooling.
G. E. ROLLER HEARTH 485 KW, 1650 deg. F, 7' wide, 18" high, 29' long & 40' cooling.
G. E. ROLLER HEARTH gas fired, radiant tube, 5' wide, 18" high, 18' long & 40' cooling.
G. E. PUSHER 240 KW, 1850 deg. F, 4' wide, 12" high, 22' long, quench conveyor.
4000 C. F. H. EXO GENERATOR with cooler above furnaces.
YOUNG BROS. GAS RECIRC. CONVEYOR BELT, 1000 deg. F, 9' wide, 24" high, 45' long, NEW.
800 C. F. H. Westinghouse Endothermic Generator.
SURF. COMB. GAS BOX, 30" wide, 18" high, 50" long, 1800 deg. F.

PAPESCH & KOLSTAD, INC.
10707 CAPITAL AVE.
OAK PARK (DETROIT 37), MICH.
Phone Lincoln 1-1100

SHEET METAL MACHINERY

EXCELSIOR STAINLESS STEEL SHEET POLISHING MACHINE #27-H
18" ½" Cap. PYRAMID TYPE SLIP ROLL FORMER
1 Ea. RAFTER & TISHKIN 8 STAND MULTIPLE ROLL 2½"
K&R #17 Wrapping BENDING ROLL 3/16"—66" Lg.

MILTON EQUIPMENT COMPANY
N.E. COR. 4th & Race St. Phila. 6, Pa.

FOR SALE --

R.R. EQUIPMENT

Immediate Delivery

- **REPAIRED**
- **REBUILT**
- **or "AS IS"**

Hopper Cars - Tank Cars
Flat Cars - Gondola Cars
50 and 70 ton Capacities
Tank Car Storage Tanks
Locomotives and Locomotive Cranes

All work on cars executed in our modern and well-equipped plant at Landisville (Lancaster County), Pennsylvania.

RAIL & INDUSTRIAL EQUIPMENT CO., Inc.

30 Church Street, NEW YORK 7, N. Y.
RR Yard & Shops, LANDISVILLE, PA

New Forged Shafting

S.A.E. SPECS. 1045

16' 9" long x 4⅞" O.D.—wt. 1200 lbs.
16' 6" long x 8⅛" O.D.—wt. 2950 lbs.
18' 0" long x 8⅛" O.D.—wt. 3200 lbs.

FLANGED BOTH ENDS
QUANTITIES AVAILABLE:
Approx. 26 tons of 4⅞" O.D.
40 tons of 8⅛" O.D.

THE BOSTON METALS CO.
313 E. Baltimore Street
Baltimore 2, Md. - Curtis 7-5050

LOCOMOTIVE CRANES FOR SALE

4—30 Ton, Diesel, 8-wheel, 75' booms, Industrial Brownhoist Ser. Nos. 11135, 11180, 11181, 11182. Browning Ser. Nos. 3395, 3500. 1943 Models

GEORGE M. MERIWETHER
Industrial Equipment
1712 Seventh Avenue, North, Birmingham 4, Ala.
Telephone No. 54-2456

Automatic Shape Cutting Machine

Magnatic Tracer. Linde model CM-15-36-3 manifold. Table 48" x 12'-0" complete with spacer parts. Used about 800 hours, in like new condition. Sacrifice at $2,000.00 F.O.B.

American Steel Fabricators
Central Trust Bldg., Altoona, Pennsylvania

CECOSTAMP HAMMER 48"x36" 1946
TUBE CUT OFF 2" to 6⅝" Taylor Wilson
TUBE BENDER 1¼" W & W Hydr. 15 H.P.
LEVELLER 22" x .012" to 125". Voss United
COLD MILL 16" D x 20" F. Farrel 2 Hi.
COLD MILL 10" D x 9" F. U. S. Mint 2 Hi.

F H CRAWFORD & CO., INC.
30 Church St., New York 7, N. Y.

MODEL 12PX LOGEMANN HYDRAULIC BRIQUETTING MACHINE FOR BALING LIGHT METALS. CHAMBER SIZE 13½" x 15" x 53" LATE MODEL.

ACE EQUIPMENT CO., 141 N. Third St., Phila.

Want to clean house?

Use The Clearing House

These are the rates that apply for space in the

Clearing House Section
Equipment and Materials Wanted Section
Contract Manufacturing Section
Business Opportunities Section

	1 Time	3 Times	6 Times	12 Times	24 Times	52 Times
1 inch	$ 12.25	$ 11.55	$ 10.95	$ 10.20	$ 9.60	$ 9.00
2 inches	23.75	21.90	20.40	19.20	18.00	17.20
3 inches	34.55	32.85	30.60	27.00	27.00	26.00
4 inches	46.10	40.80	38.40	36.00	34.55	32.65
5 inches	57.60	51.00	45.00	45.00	43.20	40.80
6 inches	65.50	61.20	54.00	54.00	51.85	48.95
8 inches	87.35	76.00	72.00	69.15	65.30	60.85
10 inches	110.00	98.00	90.00	86.35	82.00	76.00
15 inches	153.00	135.00	129.50	122.50	114.00	108.00
30 inches (Full Page)	270.00	259.00	245.00	228.00	216.00	204.00

RAILS
FOR IMMEDIATE DELIVERY

500 Tons 80# ASCE Relay
400 Tons 90# ARA-B Relay
150 Tons 90# ASCE Relay

TIE PLATES • Excellent Relay
TURNOUTS—LIGHT RAILS
TRACK ACCESSORIES

MORRISON
RAILWAY SUPPLY CORP.
814 Rand Bldg. Buffalo 3, N. Y.
MOhawk 5820

TRACK SUPPLIES — RAILS

ALSO IN STOCK
STEEL
SHEETS & PLATES
STRUCTURALS
and Aluminum Products

New **RAILS** *Relaying*

TRACKWORK of all KINDS
LIGHT RAILS—12# TO 60#—20'0" & 30'0"
HEAVY RAILS—60# TO 100#—30'0" & 33'0"
JOINT BARS, BOLTS, TIE PLATES, SPIKES & TOOLS, FROGS, SWITCHES, STANDARD & SPECIAL TRACKWORK.

SEND US YOUR INQUIRIES
KASLE STEEL CORPORATION
BOX 536 ROOSEVELT PARK ANNEX, DETROIT 32, MICH.—PHONE TIFFANY 6-4200

FOR SALE
BELGIUM REINFORCING BARS
(Round)
Spec. ASTM A15-39
Structural Grade
Approx. 70 Tons 1" x 40'
43 Tons 1¼" x 40'
Quote as is Alexandria, Virginia
(Any Reasonable Offer Considered)
Robinson Export-Import Corp.
Box 550
Alexandria, Virginia

ARE

Keep 'em rolling . . . not rusting
FOR SALE
New—Used—Reconditioned railroad freight cars • car parts • locomotives • tank cars • steel storage tanks.
MARSHALL RAILWAY EQUIPMENT
Corporation
50 Church St., New York 7, N. Y. COrtlandt 7-8090
Cable MARAILQUIP

Save on Your INDUSTRIAL TRACK
FULLY GUARANTEED
FOSTER *QUALITY*
RELAYING RAILS
Handle more cars better—cost less to install and maintain. Foster stocks all Rail Sections 12# thru 175#, Switch Material and Track Accessories.
SEND FOR CATALOGS
RAILS · TRACK EQUIPMENT · PIPE · PILING
L B FOSTER CO.
PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
ATLANTA 8 • HOUSTON 2 • LOS ANGELES 5

PIPE
VALVES and FITTINGS
All Sizes in Stock
NEW—USED
GREENPOINT IRON & PIPE CO. INC.
Bogart, Stagg & Meadow Sts. Brooklyn, N.Y.

LIFTING MAGNETS
A complete magnet service. Magnets, new & rebuilt, generators, controllers, reels, etc.
Magnet specialists since 1910
Goodman Electric Machinery Co.
1060 Broad St. Newark 2, N. J.

FOR SALE P&H OVERHEAD CRANES

Capacity	Span	Volts	Girders	Serial Nos.
Two 20 Ton	60'	DC	FB Box	7381,—2
Two 15 Ton	56'11"	DC	FB Box	7379,—80
Two 20 Ton	36'6"	AC	FB Box	7385,—6

GEORGE M. MERIWETHER
Industrial Equipment
1712 Seventh Avenue, North, Birmingham 4, Ala.
Telephone No. 54-2456

OFFERING
BRIDGE CRANES
ARNOLD HUGHES COMPANY
765 Penobscot Bldg. Detroit, Mich.
WOodward 1-1894

FOR SALE
107,900 pcs. 2-3/16" x 10-32 Pan Head Machine Screws C1038 Heat Treated Steel. Make Best Offer F.O.B. Fairfield, Ill.
Contact: Airtex Products Inc., Frank O. Putnick Fairfield, Ill.

22" x 12" x 40" Lewis 3 Hi Sheet Mill complete with automatic tables. Fawcus reduction gear and 300 hp AC motor with all controls.
O. AMES CO. Parkersburg, W. Va. 7-6431

New **RAILS** *Relaying*
We carry frogs, switches, spikes and bolts in stock and most all sections of rails and track accessories.
M. K. FRANK
480 Lexington Ave., New York, N. Y.
Park Building, Pittsburgh, Pa.
105 Lake St., Reno, Nevada

EQUIPMENT AND MATERIALS WANTED

WE BUY AND SELL USED OVERHEAD TRAVELING CRANES STRUCTURAL BUILDINGS
Your Offerings and Inquiries Solicited
BENKART STEEL & SUPPLY CO.
CORAOPOLIS, PA.

WEISS STEEL CO. INC.
600 WEST JACKSON BLVD.
CHICAGO 6, ILLINOIS
Buyers of Surplus Steel Inventories
36 Years of Steel Service

WANTED
SURPLUS STEEL
WALLACK BROTHERS
7400 S. Damen Ave. Chicago 36, Illinois

WANTED
25-40 Ton Locomotive-Cranes
(Diesel-Gasoline-Steam)
45 ton Diesel Locomotive
P. O. Box 254 New York 10, New York

WANTED
SIX TURRET LATHES, #4A Warner & Swasey, with lead screws
Wire or phone full details at once
VALLEY STEEL PRODUCTS CO.
Mr. Frank Corgiat
124 Sidney Street St. Louis 4, Mo.

WANTED
BRIDGE CRANES
ARNOLD HUGHES COMPANY
765 PENOBSCOT BLDG. DETROIT, MICH.
WOodward 1-1894

CONTRACT MANUFACTURING DIRECTORY

The directory of production services. (This section appears in the first and third issues of each month.)

GEM INSULATING FIREBRICK

★

THE GEM CLAY FORMING CO.
SEBRING, OHIO

OLSON SCREW MACHINE PRODUCTS

Made to your specifications and tolerances. From smallest up to 2⅝" diameter in steel, brass and aluminum.

OLSON MANUFACTURING CO.
101 Prescott Street — Worcester, Mass.

Nepsco

NEW ENGLAND PRESSED STEEL COMPANY
Contract Manufacturer since 1914
METAL STAMPINGS
SPECIALTIES — APPLIANCES
For Industrial and Domestic Users
P.O. BOX 29
NATICK MASSACHUSETTS

STAMPINGS — ASSEMBLIES

To drawing or sample

Drilling	Forming
Blanking	Tapping
Riveting	Welding

DESIGN & DEVELOPMENT
Toolmaking of Course

HUEBEL MFG. CO., INC.
763 Lexington Avenue
Kenilworth, N. J.

STA-FAST STEEL WEDGES

sharp edges give holding power like a screw.
Self-Aligning Steel Belt Fasteners
Standard Steel Rivets used with Self-Aligning Fasteners
STAMPINGS PUNCHINGS WASHERS
to your specifications
Catalog sent upon request
SALING MANUFACTURING COMPANY
Standard-Belt-Fastener Division
UNIONVILLE, CONNECTICUT

STANDARDIZE WITH STANDARD

MADE TO YOUR SPECIFICATION
STEEL TUBING
CARBON • ALLOY AND STAINLESS
SEAMLESS OR WELDED
PRESSURE AND MECHANICAL
MILL OR WAREHOUSE QUANTITIES
STANDARD TUBE SALES CORP.
76-01 WOODHAVEN BLVD. • BROOKLYN 27 N. Y.

THE FORMULA:

Multi-operation presses
plus
Yankee skilled workmen
over
Eighty years' manufacturing
know-how equals
Low cost metal stampings
And precision assemblies
To meet your needs

The GREIST MANUFACTURING CO.
646 Blake St., New Haven 15, Conn.

MEEHANITE® and NI-HARD CASTINGS
▼
PATTERNS
▼
MACHINE and PLATE SHOP WORK
▼
CUSTOM-BUILT MACHINERY

HARDINGE MANUFACTURING CO.
240 ARCH ST. YORK, PA.

DROP FORGE DIES

Forging Engineers—Die sinkers—Manufacturers of drop forge dies and hot work tools for presses and upsetters.

COMMERCIAL DIE COMPANY
7351 Intervale Ave., Detroit 4, Mich.
Phone: WEBSTER 3-7104 Cable Code "Comdie"

DROP FORGINGS

To Your Specifications
Prompt Quotations

BALDT ANCHOR CHAIN & FORGE DIVISION
P. O. Box 350—Chester, Pennsylvania

PRESS FORGINGS

MERRILL BROS.
5424 ARNOLD AVENUE
MASPETH, QUEENSBORO, N. Y.

Contract Machine Work

Parts and Complete Machines, Heat Treating and Grinding. Mail Blue Prints for Quotations.

GENERAL MACHINE WORKS
York, Pa.

DROP FORGINGS

Special Forgings of Every Description.
We solicit your prints or model for quotation.

Wilcox Forging Corporation
Mechanicsburg Penna.

WHEN IN THE MARKET FOR PRODUCTS—THE WANTED SECTION MAY SOLVE YOUR NEEDS.

CONTRACT MANUFACTURING

10 to 12 ft. lengths
ALL METALS
Also special screw machine products to order
EASTERN
MACHINE SCREW CORPORATION
New Haven, Conn.
Makers of
H & G DIE HEADS

Make Tools, Dies, Metal Stampings, General Machinery and Special Machinery Work

KARL'S MACHINE SHOP
30-16 31st Street Long Island City 2, N. Y.

PRODUCT WANTED
by Manufacturer

Established over 30 years, central middle west. Have facilities for drilling, milling, tapping, broaching, paint spraying. Prefer small or medium size product. Now selling 2000 active distributors. Also item to be sold by direct mail to industrial consumers.

ADDRESS BOX G-140
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

SPECIAL MACHINERY

DIAMITE *Abrasive Resistant* Castings
NI RESIST *Heat & Corrosion Resistant* Castings
P M G BRONZE *High Strength Acid Resistant* Castings
Fully Equipped—Pattern Foundry & Machine Shop Facilities—Castings to 15 tons.
Weatherly Foundry & Mfg. Co., Weatherly, Pa.

Special Washers

We carry in stock Silicon killed steel specially suited for case-hardening. Stock dies for producing washers from .0015 to ⅛" thick.

Thomas Smith Company
294 Grove St., Worcester, Mass.

Gray Iron and Semi Steel Castings, also alloyed with nickel, chrome, and molybdenum. Wood and Aluminum pattern work.

KING FOUNDRIES, INC.
Phone 823 North Wales, Montg. Co., Pa.
22 Miles from Philadelphia, Pennsylvania

BUSINESS OPPORTUNITIES

Used machines and equipments for metal working plants move when advertised in The Iron Age. Buyers look here for the items you have to sell.

FOR SALE

Small Mfg. Plant Located in Ctr. of Hydro Electric Power in State of Wash. Excellent National Product. Well staffed with experienced personnel that can remain with new owner. Has earned approx. 40% net per year for last three years on owner's investment. Total Price $150,000.

Address Box G-156
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

STEEL MEN

You may have inventions that can be profitably marketed. We are manufacturers of small fittings and equipment that are sold to steel mills. If you have a suitable patented idea, we will develop, manufacture and market it on royalty.

ADDRESS BOX C-787
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

PLANTS FOR SALE

TANK SHOP 30,000 sq. ft. with modern equipment and excellent organization. Produces high pressure work. Good earning record.
IRON FOUNDRY 35,000 sq. ft. producing castings up to 8,000 lbs. Capacity 20 tons per day. Old line of steady customers. Sale or lease.

EDWARD H. ZOLL
Industrial Properties Throughout the East
790 Broad St. Newark 2, N. J.
Phone Mitchell 2-2450

EMPLOYMENT EXCHANGE

EMPLOYMENT SERVICE

HIGH GRADE MEN—Salaries $5,000 to $25,000. Since 1915 thousands of Manufacturing Executives, Engineers, Sales Managers, Comptrollers, Accountants and other men of equal calibre have used successfully our confidential service in presenting their qualifications to employers. We handle all negotiations. Submit record with inquiry. The National Business Bourse, 20 W. Jackson Blvd., Chicago 4.

SALARIED PERSONNEL $5,000 to $30,000—This confidential service, established 1927, is geared to needs of high-grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. JIRA THAYER JENNINGS, P. O. Box 674, Manchester, Vermont.

HELP WANTED

ENGINEERS

The expansion of our plant engineering department has created excellent opportunities for engineers in the design, maintenance and construction of rolling mills

Year round outdoor living in suburban communities adjacent to plant. Seashore and mountain resort areas nearby.

Send complete resume, including salary requirements, to Employment Manager

KAISER STEEL CORP.
P.O. BOX 217
FONTANA, CALIFORNIA

HELP WANTED

STRUCTURAL STEEL SHOP SUPERINTENDENT

A large corporation requires the service of a well qualified man who is thoroughly experienced in the fabrication methods of plate and structural steel.

Write giving experience and salary requirements.

ADDRESS BOX G-157
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

PLANT SUPERINTENDENT—Western contract stamping plant has opening for superintendent thoroughly experienced in die construction and design, and metal stamping of all types with emphasis on deep drawing. Will be required to assume complete charge of operations and personnel. Excellent opportunity to prosper with growing business. Address Box G-155, Care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39.

HELP WANTED

DRAFTSMAN—Structural steel detailing experience. For interview send resume and salary requirement to Carl Wilsberg, Ch. Eng., The Standard Structural Steel Co., Box D, Station A, Hartford, Conn.

SITUATIONS WANTED

GENERAL SUPERINTENDENT I. E. Age 49. Thorough knowledge of the steel fabricating industry, a proven record of 20 years' supervision on the plant wide level, basic knowledge of incentives, production planning, cost control and general manufacturing procedures. Alert, emotionally stable, able to cooperate with staff departments. A positive hard hitting leader with the ability to get things done. 15 years' supervision and practical experience with one of the largest designers and manufacturers of heavy pressure vessels, such as heat exchangers, other heat-transfer equipment, mixing equipment, heavy weldments, and other special equipment for the oil, chemical and processing industries to the specifications of the ASME and API codes. Expert in the fabricating and welding of stainless steels, other alloys. Years of practical experience has enabled him to cut overhead, increase production and eliminate bottlenecks without labor disputes, the psychological way. Address Box G-158, Care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39.

PLANT ENGINEER. Twenty-five years' experience, Utilities, Construction, Plant Lay Out, Maintenance, and Machine Tools. Now well located but have good reason for considering. Address Box G-146, Care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39.

SENIOR DESIGNING ENGINEER desires to relocate with years of practical experience largely in the agricultural and automotive field. Highest references. Engineer, care P. O. Box 2142, Knoxville 1, Tenn.

ELECTRIC FURNACE

STEEL CASTINGS

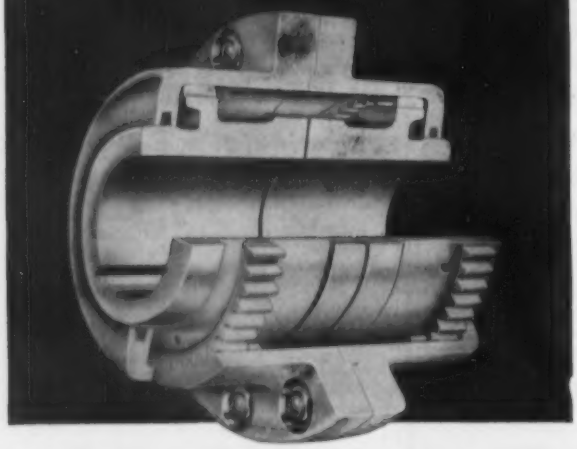
If you are interested in minimum machining and assembly costs — ease of welding — better distribution of metal — better strength and weight ratios — better fit — better performance — greater fatigue resistance — longer life and less replacement — you should be interested in "C" electric furnace steel castings because these foundry engineered castings give you steel at its best. And — by virtue of alloy and heat treating — they offer you a choice of mechanical properties to fit your specific needs.

Investigate!

Perhaps by cooperating with your engineers in details of design and pattern we may be able to help you achieve improved production at lower costs.

CRUCIBLE STEEL CASTING CO.
LANSDOWNE, PENNA.

POOLE



A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST.

FLEXIBLE COUPLINGS

POOLE FOUNDRY & MACHINE COMPANY — WOODBERRY, BALTIMORE, MD.

ADVERTISERS IN THIS ISSUE

An asterisk (*) beside the name of advertiser indicates that a booklet, or other information, is offered in the advertisement. Write to the manufacturers for your copies today.

A

Accurate Perforating Co. 285
Ace Equipment Co. 310
*Acheson Colloids Co. 103
*Acme Steel Co. 28, 29
Acorn Iron & Supply Co. 284
Aetna-Standard Engineering Co., The 111
Airtex Products, Inc. 310
Ajax Engineering Corp. 239
*Allen Manufacturing Co. 212
Alliance Machine Co., The 123
*Allis-Chalmers Mfg. Co. The Buda Division 211
Alter Company 295
Alvey-Ferguson Co. 256
American Air Compressor Corp. 308
*American Brass Co., The Between Pages 270, 271
*American Bridge, Division United States Steel Corp. 187
American Cast Iron Pipe Co. 98
American Gas Association 124
*American Gas Furnace Co. 139
*American Manganese Bronze Co. 285
*American Pulverizer Co. 229
American Shear Knife Co. 271
American Steel Fabricators 310
American Steel & Wire Div., United States Steel Corp. Between Pages 16, 17
American Welding & Mfg. Co., The 170
American Zinc Sales Co. 144
Ames, O., Co. 311
Apex Tool & Cutter Co. 283
Arcos Corp. 216, 217
Armel, James P. 309
Armstrong Bros. Tool Co. 284
Armzen Co. 108
*Arwood Precision Castings Corp. 281
*Atlas Chain & Mfg. Co. 243
*Aviation Developments, Inc. 276

B

*Babcock & Wilcox Co., The Tubular Products Div. 74
Baird Machine Co., The 96
Baker, J. E. Co., The 86
Baker Industrial Truck Div. of The Baker-Raulang Co. 10
Baldt Anchor, Chain & Forge Div. 312
*Bardons & Oliver, Inc. 42, 43
Barry Controls Incorporated ... 90
Bay State Abrasive Products Co. 14, 15
Beatty Machine & Mfg. Co. 226
Belyea Co., Inc. 309
Benkart Steel & Supply Co. 311
Bennett Machinery Co. 309
Bertsch & Company 315
Bethlehem Steel Co. 1
*Binks Mfg. Co. 214
*Bliss, E. W. Co., Rolling Mill Div. 87
Bliss & Laughlin, Inc. 132
Boston Metals Co., The 310
*Brainard Steel Div., Sharon Steel Corp. 89, 112
Brandt, Charles T., Inc. 224
*Brighton Screw & Mfg. Co., The 71
*Brooks Equipment & Mfg. Co. 36, 37
Brownell, Hazard, Machine Tools, Inc. 308
*Bucyrus-Erie Co. 142
*Bullard Co., The 76, 165
*Bunting Brass & Bronze Co. .. 246

C

*Carborundum Co., The Ferro Carbo Div. 282, 284
Carlson, G. O., Inc. 63
Carpenter Steel Co., The 180
Carpenter Steel Co., The Alloy Tube Div. 129
Cattie, Joseph P. & Bros. 316
Chase Brass & Copper Co., Inc. 185
*Chemical Corp. 278
Chicago Electric Co. 309
*Cincinnati Bickford Tool Co., The 49
Cincinnati Gear Company, The 280
*Cincinnati Gilbert Machine Tool Co. 181
Cincinnati Milling Machine Co., The 168
Cincinnati Milling Machine Co. Grinding Wheels Div. 221
*Cincinnati Shaper Co., The 20, 21 Between Pages 176, 177
Clark Bros. Bolt Co. 245
Cleveland-Cliffs Iron Co., The .. 65
*Cleveland Metal Abrasive Co.. 85
Cleveland Punch & Shear Works Co., The 178
Climax Molybdenum Co. 72
Colorado Fuel & Iron Corp., The Wickwire Spencer Steel Div. .. 78
Columbia-Geneva Steel Div. United States Steel Corp. Between Pages 16, 17
The Columbus Anvil & Forging Co. 312
Commercial Die Co. 312
Conco Engineering Works Crane & Hoist Div. 231
Continental-Diamond Fibre Division of The Budd Co., Inc. ... 207
*Cooper Alloy Corp. 159

(Continued on Page 316)

Loosens FROZEN PARTS FAST!

Handy
Won't Leak
Shoots 3 Feet

Same formula as famous Kroil that has pleased 14,000 industrial users for 10 years or more.

Loosens stuck together metal parts, bushings, bearings, bolts, screws, pipe, etc., "anything from an embalmer's needle to a bulldozer," one customer said.

"Like an extra employee," said another. "Turned rust into mush, put $50,000 equipment back to work."

You too can get these results.

Try Aerokroil at our risk. Send $2 cash, and we'll pay postage.

KANO LABS. 1091 S. Thompson Lane Nashville 11, Tenn.

12-OZ. CAN $2.
F.O.B. NASHVILLE
CASE OF 12 $18.75

A SMALL LOT
METAL STAMPING SERVICE
AT LOWEST POSSIBLE DIE COST

FIRST... In Experience • In Know-how • In Research • In Quality • In Service

The sketch briefly describes the cost of a typical part made for one of our thousands of customers.

We have a short run stamping service to offer beyond comparison.

EXAMPLE

$63.20 for first 100 pieces including tools. $5.20 for each additional 100 pieces plus material.

Factory trained representatives in all centers. Write for full details.

DAYTON ROGERS
Manufacturing Company
MINNEAPOLIS 7N, MINN.

Versatility counts in
HOT DIP GALVANIZING

any size or shape product, any size
order from the smallest to the largest

Excellent facilities for pickling and oiling

ENTERPRISE
GALVANIZING COMPANY
2525 E. Cumberland Street Philadelphia 25, Pa.

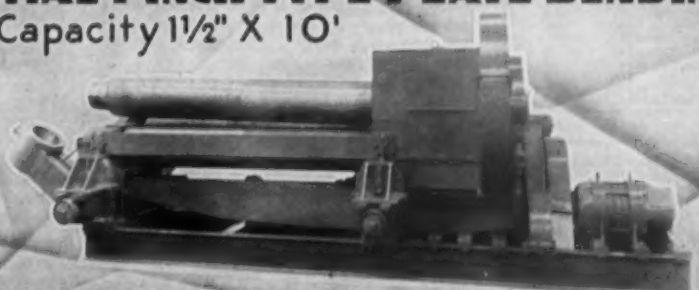
Formed steel bridge rails

WE HAVE STEEL AND PRESSES - - - for making these sections in lengths up to 20' ..... steel up to ½" thick!

MAY WE BID ON YOUR REQUIREMENTS

HARRISON SHEET STEEL CO.
4718 W. FIFTH AVENUE CHICAGO 44

INITIAL PINCH TYPE PLATE BENDING ROLL
Capacity 1½" X 10'



Our Line
Light and heavy machinery for all classes of sheet metal, plate and structural work.

BERTSCH & COMPANY, CAMBRIDGE CITY • INDIANA

COWLES

GANG SLITTING KNIVES

OVER 30 YEARS EXPERIENCE

Standard for Service and Durability. Ground to extremely close Tolerances and Finish. Made by Toolmakers.

COWLES TOOL COMPANY

2086 W. 110th ST. CLEVELAND 2, OHIO

HOT DIP GALVANIZING

JOSEPH P. CATTIE & BROTHERS, INC.

2520 East Hagert St.

Phone: Re 9-8911 Phila. 25, Pa.

CHICAGO

STEEL HAND AND POWER BENDING BRAKES

For Single and Quantity Runs Bending Steel Plate and Sheet Metal

Special Bending Brakes

Double Folder Brakes

4008

DREIS & KRUMP MANUFACTURING COMPANY

CHICAGO

7430 S. Loomis Blvd., Chicago 36, Ill.

THE INTERNATIONAL HARDNESS SCALES

(BRINELL-SHORE)

are included in Our Improved Portable Scleroscope Model D-1. This efficient Single Scale tester registers Brinell-Shore values under otherwise inaccessible conditions. 16½ portable for floor and field work, dead soft metals or superhard steel either of brittle or thin cross section, non-destructive, accurate, speedy, always ready and foot-proof.

Good for Interesting Technical Bulletin and Prices

THE SHORE INSTRUMENT & MFG. CO., INC.

9025 Van Wyck Ave., Jamaica, N. Y.

zinc

WIRE—STRIP, COILED FOR ELECTRIC FUSE ELEMENTS

EYELETS ALSO BRASS OR STEEL

THE PLATT BROS. & CO., WATERBURY, CONN.

ADVERTISERS IN THIS ISSUE

(Continued from Page 314)

Copperweld Steel Co., Ohio Seamless Tube Div. 236
Cowles Tool Co. 316
Crawford, F. H. & Co., Inc. 310
Crucible Steel Casting Co. 314
Crucible Steel Co. of America 67
*Cullen-Friestedt Co. 206
Curry, Albert & Co., Inc. 308

D

Danly Machine Specialties, Inc. Between Pages 16, 17
Davidson Pipe Co., Inc. 308
Davis Keyseater Co. 318
Dayton Rogers Manufacturing Co. 315
*DeVlieg Machine Co. 99
Diamond Machine Tool Co. 166
Dominion Foundries and Steel Limited 307
Donahue Steel Products Co. 306
Dony, D. E. Machinery Co. 306
Dreis & Krump Mfg. Co. 316
Du Pont de Nemours, E. I. & Co. Inc., Electrochemicals Dept. ... 122
Duraloy Co., The 220
Dykem Company, The 318

E

*Eastern Machine Screw Corp., The 234, 313
Eastern Machinery Co., The 308
Eastern Tool & Stamping Co., Inc. 205
*Eaton Mfg. Co., Reliance Div. 105
Electro Metallurgical Co., a Div. of Union Carbide & Carbon Corp. 54, 55
Elox Corporation of Michigan .. 281
Emerman Machinery Corp. 305
Enterprise Galvanizing Co. 315
*Erie Strayer Co. 250
Espen-Lucas Machine Works, The 317
Exact Weight Scale Co. 248

F

Falk Machinery Co. 308
Farrel-Birmingham Co., Inc. 93
Fate-Root-Heath Co. 183
Federal Machine & Welder Co. .. 251
*Federal Press Co., The 228
Federal Products Corp. 242
*Ferry Cap & Set Screw Co., The 73
Finkl, A. & Sons Co. 232
*Fischer Special Mfg. Co. 230
Foote Mineral Co. 11
Foster, L. B. Co. 311
Frank, M. K. 311
*Fuller Company 110

G

Galland-Henning Mfg. Co. 16
Gallmeyer & Livingston, Inc. .. 270
Garrett, Geo. K., Co., Inc. 9
Gem Clay Forming Co., The ... 312
*General Box Co. 241
General Chemical Div. Allied Chemical & Dye Corp. 70
*General Electric Co. ...22, 23, 26, 27
General Machine Works 312
*Gisholt Machine Co. 77
Gleason Works Between Pages 80, 81
Globe Steel Abrasive Co. 209
Goodman Electric Machinery Co. 310
Goss & DeLeeuw Machine Co. ... 317
Granite City Steel Co. 109
Gray, G. A. Company 107
Greenlee Bros. & Co. 57
Greenpoint Iron & Pipe Co., Inc. 310
Greist Manufacturing Co., The .. 312
Griffin Manufacturing Co. 285

H

Halliden Machine Co., The 258
Hannifin Corp. 273
*Hansen Manufacturing Co. 222
*Hanson-Van Winkle-Munning Co. 34
Harbison Walker Refractories Co. 118, 119
Hardinge Manufacturing Co. .. 312
Harper, H. M. Co., The Between Pages 16, 17
Harrison Sheet Steel Co. 315
*Haveg Corp. 184
Haynes Stellite Company, a Div. of Union Carbide & Carbon Corp. .....Between Pages 16, 17
Hayward Company, The 317
Hendrick Manufacturing Co. ... 271
Henry, A. T. & Comany, Inc. ... 306
*Hewitt-Robins Incorporated 143
Hill Acme Co., The Canton Div. 274
*Homstead Valve Mfg. Co. 17
*Hooker Electrochemical Co. ... 75
Hoskins Manufacturing Co. Inside Front Cover
Houghton, E. F. & Co. 56
Husbel Mfg. Co., Inc. 312
Hughes, Arnold Co. 310, 311
Hyde Park Foundry & Machine Co. 94
Hydraulic Press Mfg. Co., The .. 91
Hyman, Joseph & Sons 306

I

Industrial Brownhoist Corp. 104
*Ingersoll-Rand Co. 92
Ingersoll Steel Division, Borg-Warner Corp. 113
Inland Steel Co. 188
Iron & Steel Products, Inc. 304
Ironsides Co., The 163
Ivy Company, The 274

J

Jennings, Jira Thayer 313
Jessop Steel Company Between Pages 176, 177
Johnson Bronze Co. 80
Johnson Steel & Wire Co., Inc. 40, 41

ADVERTISERS IN THIS ISSUE

K

Kaiser Chemicals Div., Kaiser Aluminum & Chemical Sales, Inc. 116, 117
Kaiser Steel Corp. 313
Kane & Roach, Inc. 120
Kano Laboratories 315
Karl's Machine Shop 313
Kasle Steel Corp. 311
Kennametal, Inc. 102
Kester Solder Co. 186
Kinderman, Lou F. 308
King Foundries, Inc. 313
Kingsbury Machine Tool Corp. ..32, 33
*Kinney Mfg. Div., The New York Air Brake 280
*Kirk & Blum Mfg. Co. 240
Knight, Maurice A. 213

L

Lamson & Sessions Co., The ... 66
Land, L. J., Inc. 309
Long Machinery Co. 309
*LeBlond, R. K. Machine Tool Co., The 18, 19
Leeds & Northrup Co. Between Pages 48, 49
Lees-Bradner Co., The 61
Leland-Gifford Co. 317
*Lewthwaite, T. H. Machine Co., Inc. 317
*Lincoln Electric Co. 208
Lindberg Engineering Co. 58, 59
*Linde Air Products Co., a Div. of Union Carbide & Carbon Corp. 30, 79
*Lipe Rollway Corp. 225
Lithium Corp. of America, Inc. 137
Lobdell United Div., United Engineering & Foundry Co. ... 247
*Lodge & Shipley Co., The 68
Logan Co. 255
Lowe Bros. Co., The 136
Luria Bros. & Co., Inc. 293

M

McKay Machine Co., The Between Pages 48, 49
McLouth Steel Corp. Between Pages 238, 239
MacCabe, T. B., Co. 309
*Mahon, R. C. Co., The 64
Manhattan Rubber Div. Raybestos-Manhattan, Inc. 141
Malleable Founders Society 259
*Marchant, Geo. F., Co. 273
Marshall Railway Equip. Corp. .. 311
Merrill Bros. 312
Meriwether, George M. 310, 311
Metal Treating Equipment Exchange 309
Metal Treating Institute 125
Michigan Steel Tube Prods. Co. 235
Michigan Tool Co. 215
Micromatic Hone Corp. Between Pages 238, 239
Midvale Company 146
Miles Machinery Co. 306
Miller Electric Mfg. Co., Inc... 140
Milton Equipment Co. 310
Molybdenum Corporation of America 135
*Monarch Machine Tool Co. ..38, 39
Morrison Railway Supply Co. ... 311
Morton Manufacturing Co. 279

N

*Naresco Equipment Corp. 44, 45
National Airoil Burner Co. 282
National Business Bourse, Inc. .. 313
National Carbon Co., a Division of Union Carbide & Carbon Corp. 83
National Machinery Exchange .. 308
National Steel Corp. 69
National Tube Div., United States Steel Corp... Between Pages 16, 17
*Nelson Stud Welding Div. of Gregory Industries, Inc. ...218, 219
New England Pressed Steel Co. 312
*New York State Dept. of Commerce 160
Niagara Machine & Tool Works 114, 115
*Nice Ball Bearing Co. 285
North Carolina Dept. of Conservation & Development 13
Norton Company 95

O

*Oakite Products, Inc. 257
*Ohio Crankshaft Co., The 31
Ohio Gear Co. 233
Ohio Seamless Tube Div. of Copperweld Steel Co. 236
Oliver Corp., The, A. B. Farquhar Div. 249
Olson Manufacturing Co. ..279, 312
Osborn Mfg. Co., The 5

P

Pangborn Corp. ....Inside Back Cover
Papesch & Kolstad, Inc. 310
*Pedrick Tool & Machine Co. 303
Philadelphia Gear Works, Inc... 60
Pickands Mather & Co. 100
Platt Bros. & Co., The 316
Plume & Atwood Mfg. Co. 253
Plymouth Locomotive Works Div. of The Fate-Root-Heath Co. ... 183
Pollard Bearings, Ltd. 106
Poole Foundry & Machine Co. ... 314
Power Press Specialists 306
Purdy Company, The 309
Pyrene-C-O-Two 126

R

Rail & Industrial Equip. Co., Inc. 310
Raybestos-Manhattan, Inc. Manhattan Rubber Div. 141
*Republic Steel Corp. 50, 51
Robinson Export-Import Corp. .. 311
Roebling's, John A. Sons Corp. 134
Rollway Bearing Co., Inc. 138
*Roto-Finish Company 269
*Rust-Oleum Corp. Between Pages 48, 49
Ryerson, Jos. T. & Son, Inc. 6

S

Saling Manufacturing Company 312
Sandusky Foundry & Machine Co. 252

(Continued on Page 318)

Where else can you find such

BUCKET STAMINA, LOAD CAPACITY, DIGGING POWER!

Yes you're looking at a man-size Hayward Electric Bucket! Every user acclaims it as the finest hook-on bucket. Nothing like it for foundries, steel mills, power plants. Interchangeable with your electric magnet.

The Hayward Company, 50 Church St., New York 7, N. Y.

HAYWARD BUCKETS

CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES

famous for performance since 1888

TRUE-TRACE HYDRAULIC TRACER CONTROLS

Application Engineering — Installation

Tomorrow's Tooling Techniques TODAY! Specify machine tool application when requesting informative literature.

TRUE-TRACE SALES CORP.
EL MONTE 1, CALIF.
Call Collect — CUmberland 3-4761

LELAND-GIFFORD the BIG NAME in DRILLING MACHINES

LELAND-GIFFORD COMPANY, WORCESTER, MASSACHUSETTS

LEWTHWAITE Cutters — HAND OPERATED

Our lever type bench cutters are made in three sizes—A, B, and C—and they couldn't be more versatile.

For example, on the No. B, by merely changing the blades, you can cut up to 1/2" rods, 1 1/2" x 1 1/2" x 3/16" angles, 2" x 3/8" flat bars, and 1 1/2" and 3/4" channels. Weight about 77 lbs. which makes it handy for use in the field.

Shipment can regularly be made immediately from our New York stock.

SEND FOR CATALOG SHEETS ON OUR COMPLETE LINE OF METALWORKING TOOLS

T. H. LEWTHWAITE MACHINE CO., INC.
308 East 47th Street — New York 17, N. Y.

Cutting off Machines for Sawing All Kinds of Metals

THE ESPEN-LUCAS MACHINE WORKS
FRONT AND GIRARD AVE., PHILADELPHIA, PENNA.

GOSS and DE LEEUW
MULTIPLE SPINDLE
CHUCKING MACHINES
Tool-Rotating Type
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

Popular package is 8-oz. can fitted with Bakelite cap holding soft-hair brush for applying right at bench; metal surface ready for layout in a few minutes. The dark blue background makes the scribed lines show up in sharp relief, prevents metal glare. Increases efficiency and accuracy.

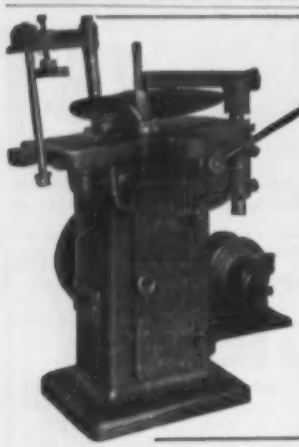
Write for sample on company letterhead

THE DYKEM COMPANY
2303G North 11th St. • St. Louis 6, Mo.

CUT SCRAPER TIME
END NIGHT CLEANUP & MORNING REBLUING

DYKEM HI-SPOT BLUE No. 107 is used to locate high spots when scraping bearing surfaces. As it does not dry, it remains in condition on work indefinitely, saving scraper's time. Intensely blue, smooth paste spreads thin, transfers clearly. No grit; noninjurious to metal. Uniform. Available in collapsible tubes of three sizes. Order from your supplier. Write for free sample tube on company letterhead.

THE DYKEM CO., 2303G NORTH 11TH ST., ST. LOUIS 6, MO.



"DAVIS" KEYSEATER

Low in Cost. Durable.
Easy to operate.
Table adjustable for straight or taper keyways.
Three sizes. Keyways 1/16" up to 1".

DAVIS KEYSEATER CO.
400 Exchange St.
Rochester 8, N. Y.

READ
THE ADVERTISING PAGES

Equipment Materials Services

Sources for every need in the Metalworking industry.

Use reply postcard on Page 237 to request further information on products advertised in this issue.

The Iron Age

ADVERTISERS IN THIS ISSUE

(Continued from Page 317)

Sandvick Steel, Inc. 97
Service Foundry Div. of Avondale Marine Ways, Inc. 283
*Sharon Steel Corp. 8
*Sheffield Corporation, The ... 101
Sheldon Machine Co., Inc. 267
*Shepard Niles Crane & Hoist Corp. 268
Shlagro Steel Products Corp. .. 182
Shore Instrument & Mfg. Co., Inc., The 316
Signode Steel Strapping Co. 12
*Silent Hoist & Crane Co. 272
Simonds Abrasive Co. 81
Simonds Saw & Steel Co. 84
Smith, A. O., Corp. Welding Products Div. 52, 53
Smith, Thomas Co. 313
Springfield Machine Tool Corp. 24, 25
*Standard Conveyor Co. 262
Standard Oil Co. of Indiana..46, 47
Standard Pressed Steel Co. Between Pages 204, 205
Standard Steel Treating Co. ... 291
Standard Tube Sales Corp. 312
Steel & Tube Div., Timken Roller Bearing Co. .....Front Cover
*Stevens, Frederic B., Inc. 4
Stonehouse Signs, Inc. 245
Sun Oil Co. Between Pages 112, 113
Sun Shipbuilding & Dry Dock Co. Between Pages 48, 49
Superior Tube Co. 286
*Surface Combustion Corp. 174
*Sutton Engineering Co. 223

T

Tennessee Coal & Iron Div., United States Steel Corp. Between Pages 16, 17
Templ Corporation 278
Thermal Research & Engineering Corp. 254
*Thomas Flexible Coupling Co... 266
Tickle, Arthur, Engineering Works, Inc. 227
Timken Roller Bearing Co., The Front Cover
Titan Metal Mfg. Co. Between Pages 204,205
*Tomkins-Johnson Co., The 261
*Torrington Co., Needle Bearing Div. 130
Towmotor Corp. 265
True-Trace Sales Corp. 317

U

Union Carbide & Carbon Corp., Electro Metallurgical Co. ..54, 55
Union Carbide & Carbon Corp., Haynes Stellite Co. Between Pages 16, 17
Union Carbide & Carbon Corp., Linde Air Products Co. 30,79
Union Carbide & Carbon Corp., National Carbon Co. 83
Unit Crane & Shovel Corp. 210
United Engineering & Foundry Co. Between Pages 270, 271
United Wire & Supply Corp. 276
United States Steel Export Co. Between Pages 16, 17
United States Steel Corp. Between Pages 16, 17, 187
United States Steel Supply Div., United States Steel Corp. Between Pages 16, 17
U. S. Steel Wire Spring Co., The 274

V

Valley Steel Products Co. 311
Vanadium-Alloys Steel Co. 121
Vanadium Corp. of America 176
Verson Allsteel Press Co. Back Cover
Vickers, Inc. 48
*Vickers Electric Division, Vickers Inc. 62
Victor Equipment Co. 82
Virginia Gear & Machine Corp. 60

W

Wallack Bros. 311
Wallingford Steel Co., The 244
Warner & Swasey Co. 127
Washington Steel Corp. 272
*Waterbury-Farrel Foundry & Machine Co. 88
Weatherly Foundry & Mfg. Co... 313
*Webb Corp., The 268
Weirton Steel Co. 69
Weiss, B. M., Co. 309
Weiss Steel Co., Inc. 311
Western Automatic Machine Screw Co. 263
*Wheelabrator Corp. 131
Wheeling Steel Corp. 133
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp. .. 78
Wigglesworth Industrial Corp. ... 306
Wilcox Forging Corp. 312
Wisconsin Motor Corp. 264
Wood, R. D., Co. 172

Y

*Yoder Co., The 128
Youngstown Welding & Engineering Co. 35

Z

Zoll, Edward H. 313

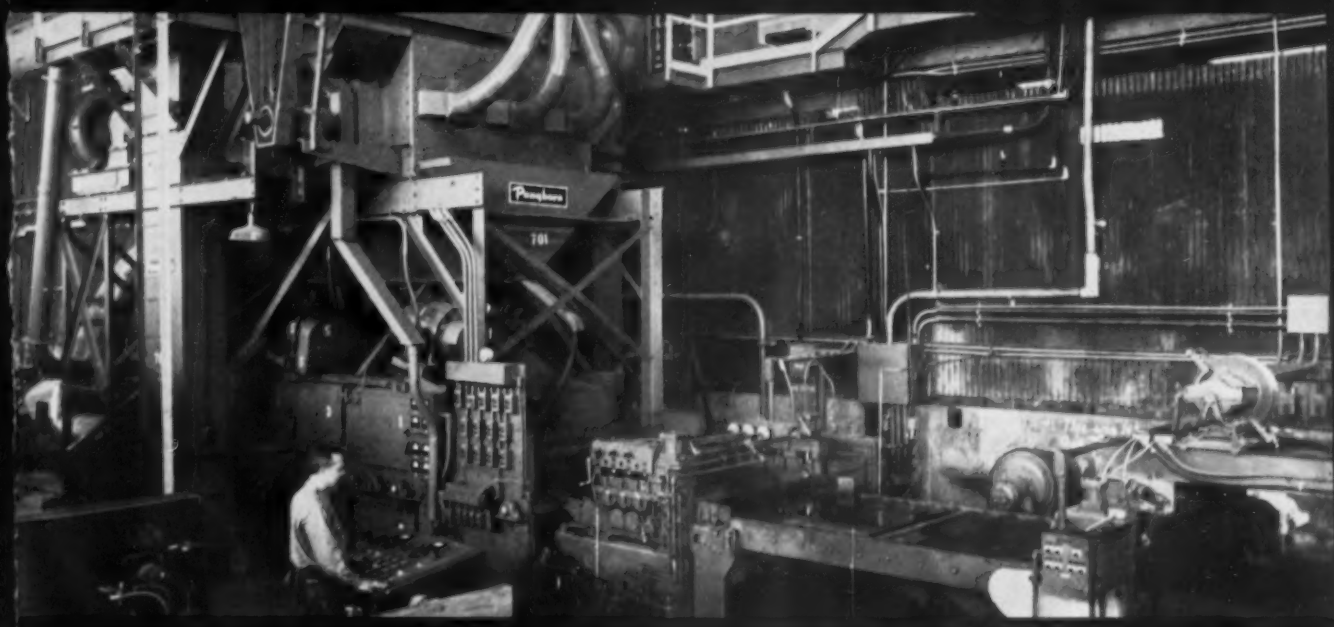
CLASSIFIED SECTION

Business Opportunities 313
Clearing House 304-311
Contract Manufacturing 312-313
Employment Exchange 313
Equipment & Materials Wanted.. 311

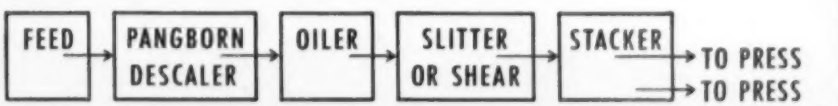
STEEL FABRICATORS!

NOW Pangborn offers you

Automation!



For fabricators using flat steel, coils, cut lengths—Pangborn Rotoblast® Descaling Machines offer *straight line* operation. One feed through descaler, oiler, slitter and stacker!



Here's How You Benefit!

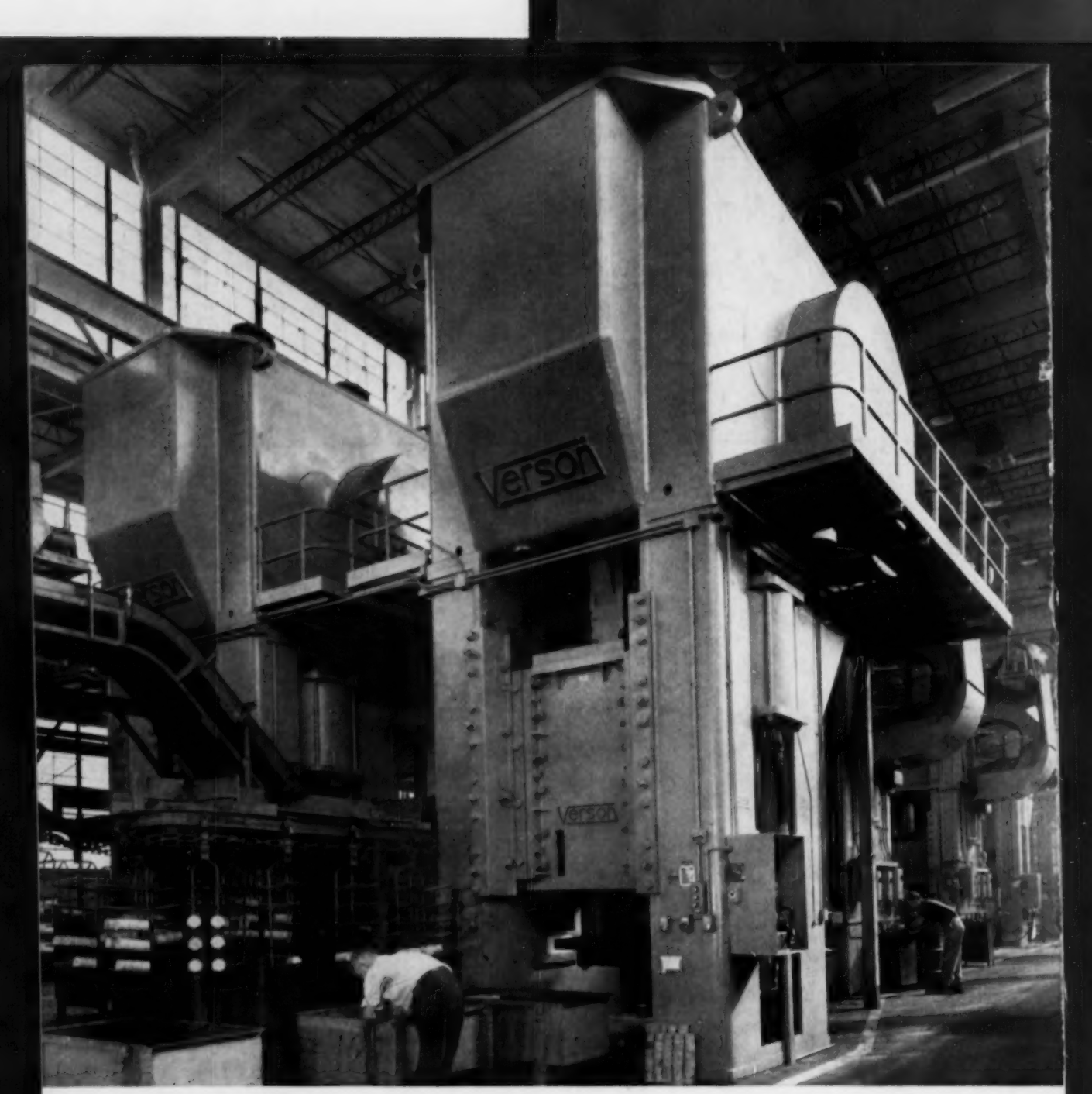
- *You cut costs by using hot rolled unpickled steel.*
- *You speed production.*
- *You reduce labor costs.*
- *You eliminate problem of acid fumes and acid disposal.*
- *You use minimum floor space.*

For full details on automation for fabricators, write for Bulletin Number 224 to Pangborn Corporation, 1500 Pangborn Blvd., Hagerstown, Maryland.

Manufacturers of Blast Cleaning and Dust Control Equipment.

Pangborn

BLAST CLEANS CHEAPER



Verson

ECCENTRIC PRESSES head the line at Heintz Manufacturing Company

● The two Verson Eccentric Presses illustrated above are each rated at 1500 tons with 4500 tons drive capacity. The presses are a key part of the cold extrusion lines at Heintz Manufacturing Company, Philadelphia, said by many to be "the birthplace of cold extrusion of steel in America." Both presses are specially designed with fast operating speeds to fit the production process.

Like all Verson Eccentric Presses, these represent the ultimate in mechanical press design. They provide power, strength, resistance to deflection, accuracy and efficiency unmatched by any other mechanical presses. This design coupled with Verson production know how means that when you select a Verson press, you get more than just a press. You get a production tool, tailored to your requirements as an integrated part of your production process.

It will pay you to take advantage of Verson experience in the expansion or modernization of your facilities. With a long list of advancements to its credit, Verson may be able to show you the way to lower unit production costs. For recommendations, send an outline of your needs.

VERSON ALLSTEEL PRESS CO.

9314 S. Kenwood Ave., Chicago 19, Illinois • South Lamar at Ledbetter Drive, Dallas, Texas

MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TOOLING •

DIE CUSHIONS • VERSON-WHEELON DIRECT ACTING HYDRAULIC PRESSES